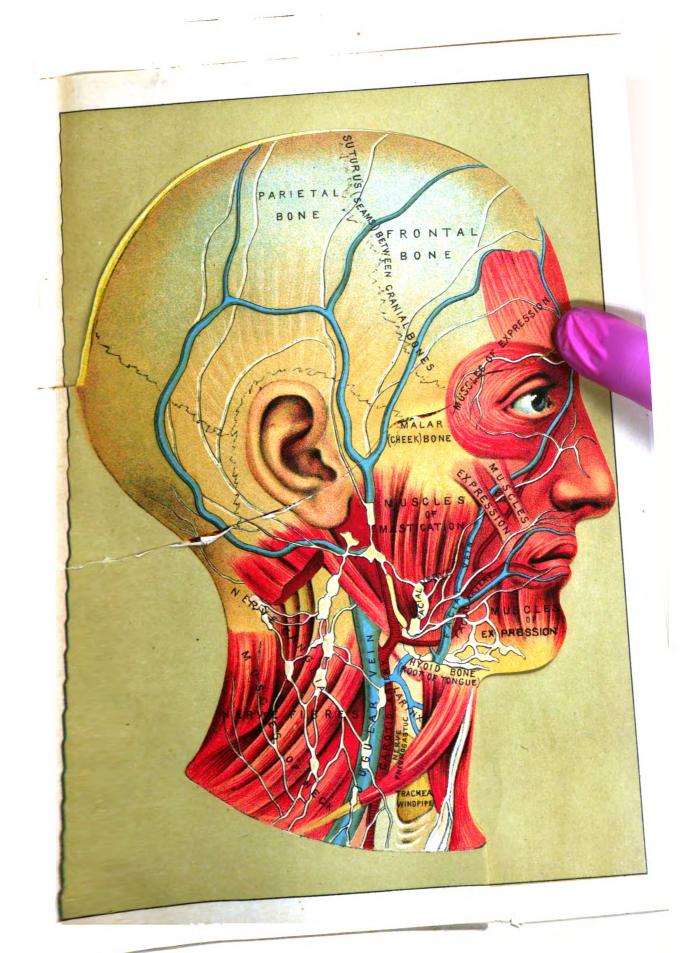
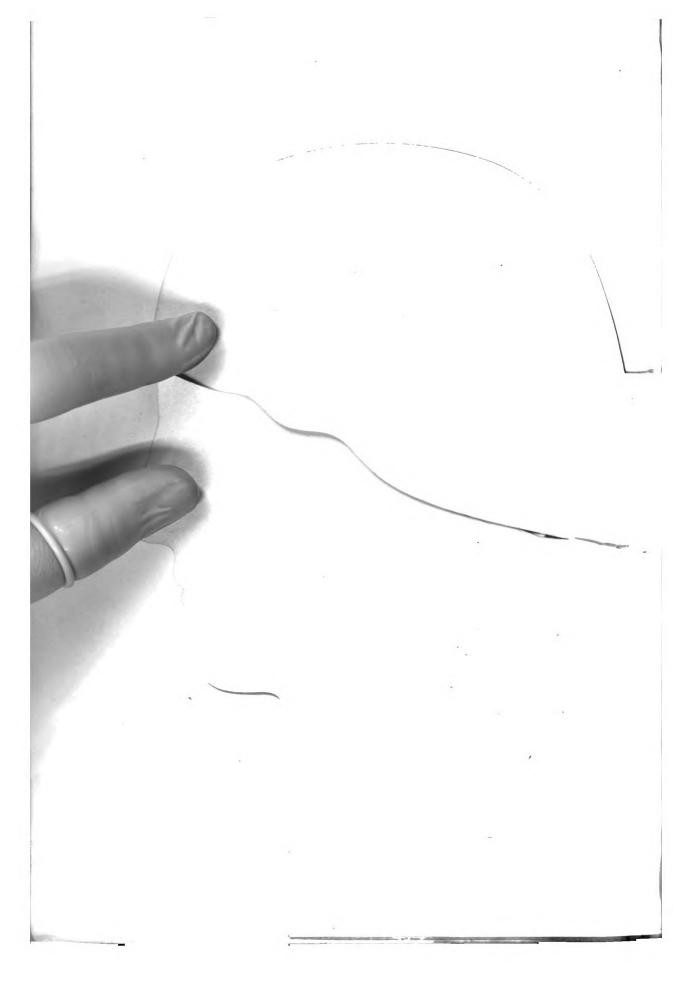
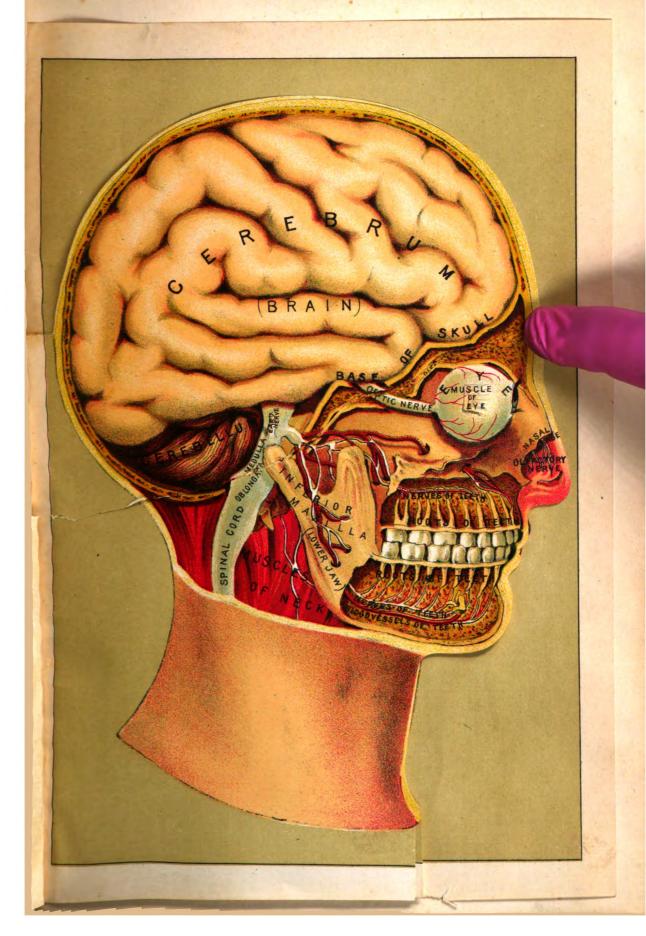
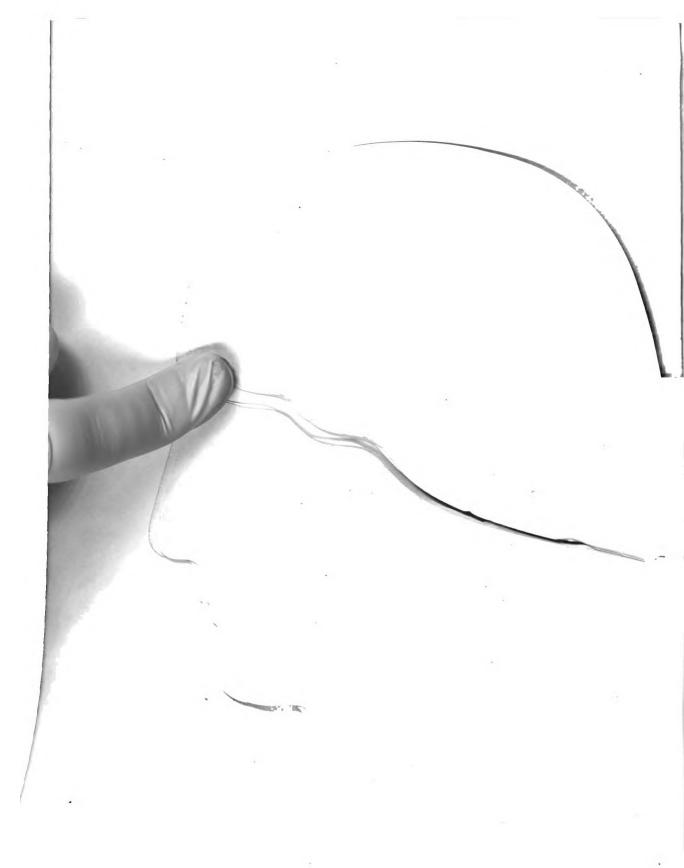


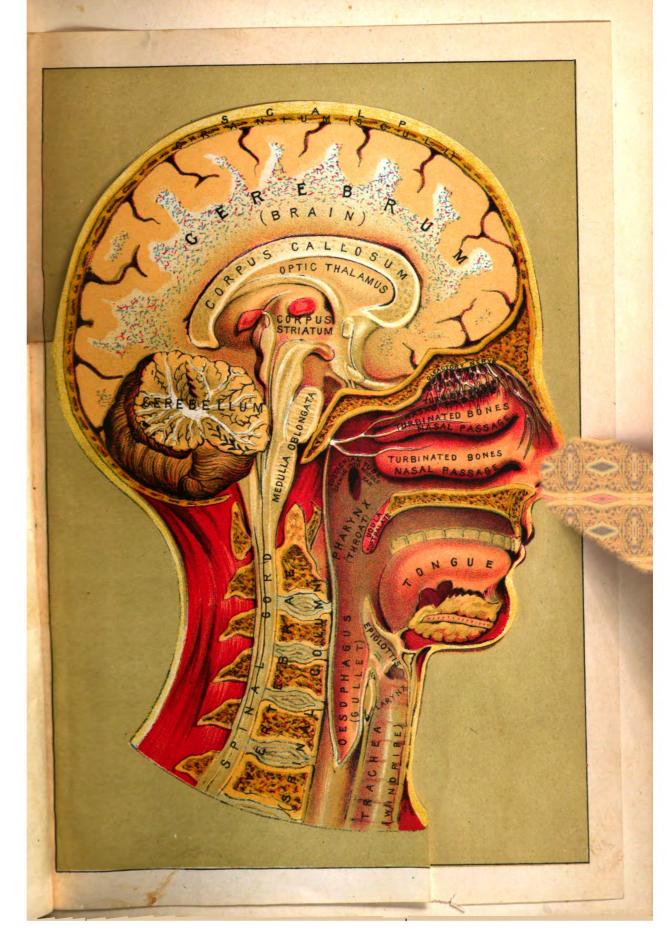
	*			
			3	**
				4
		*		

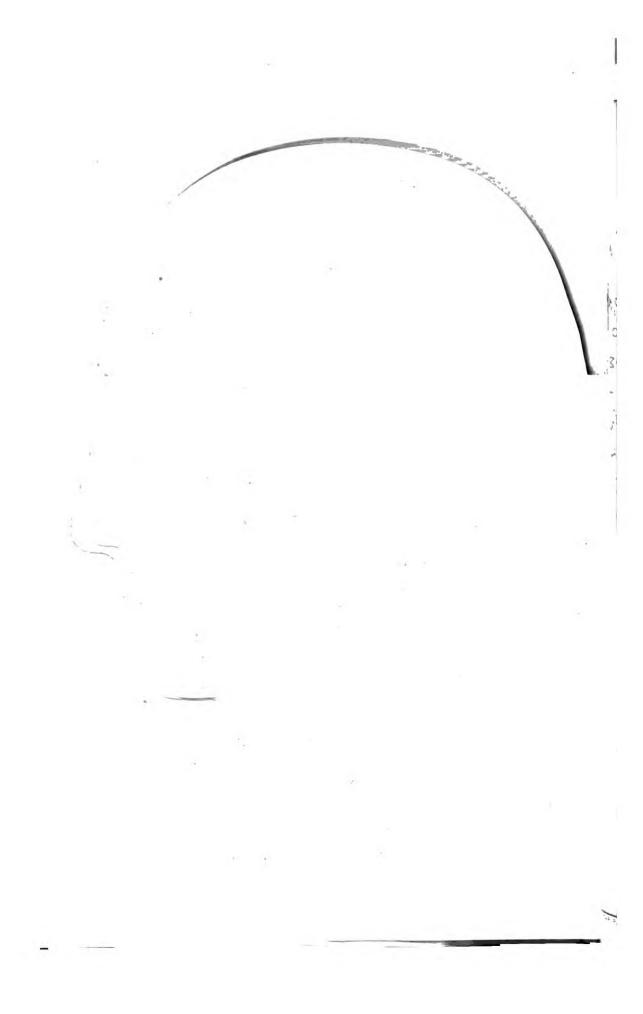


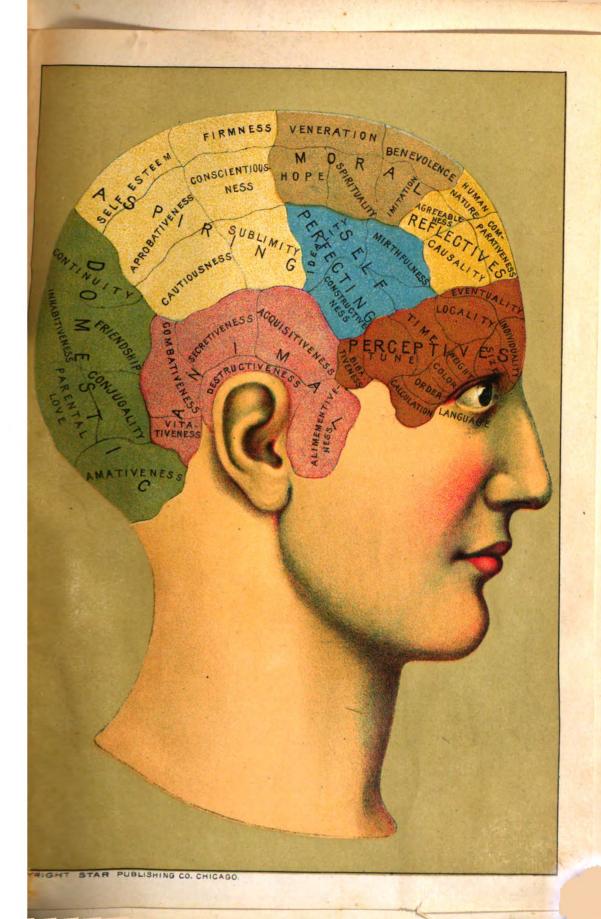




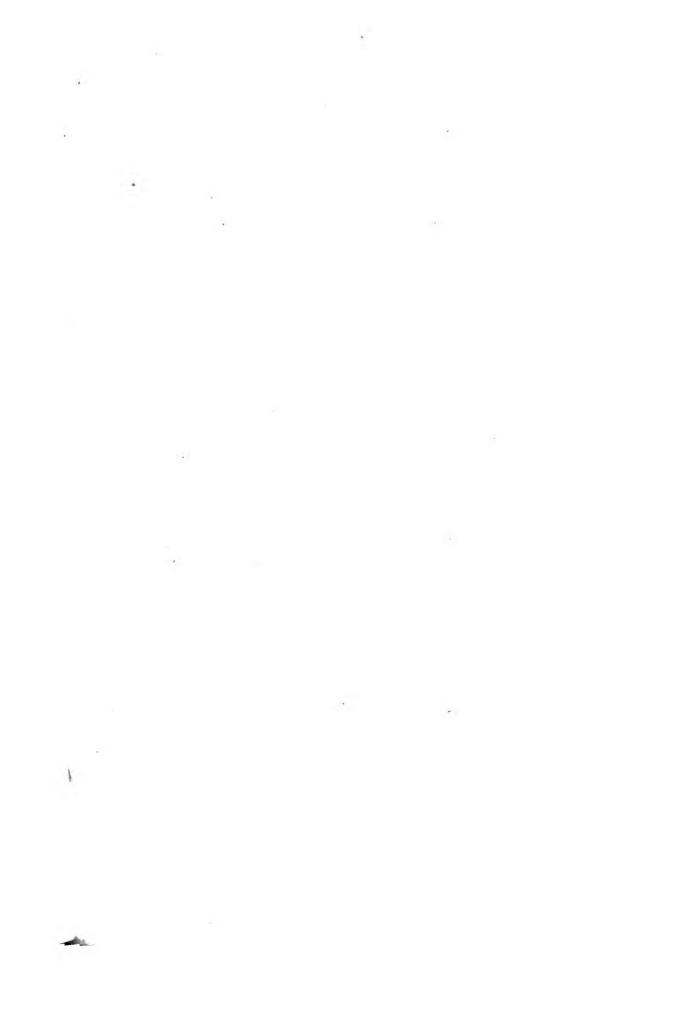


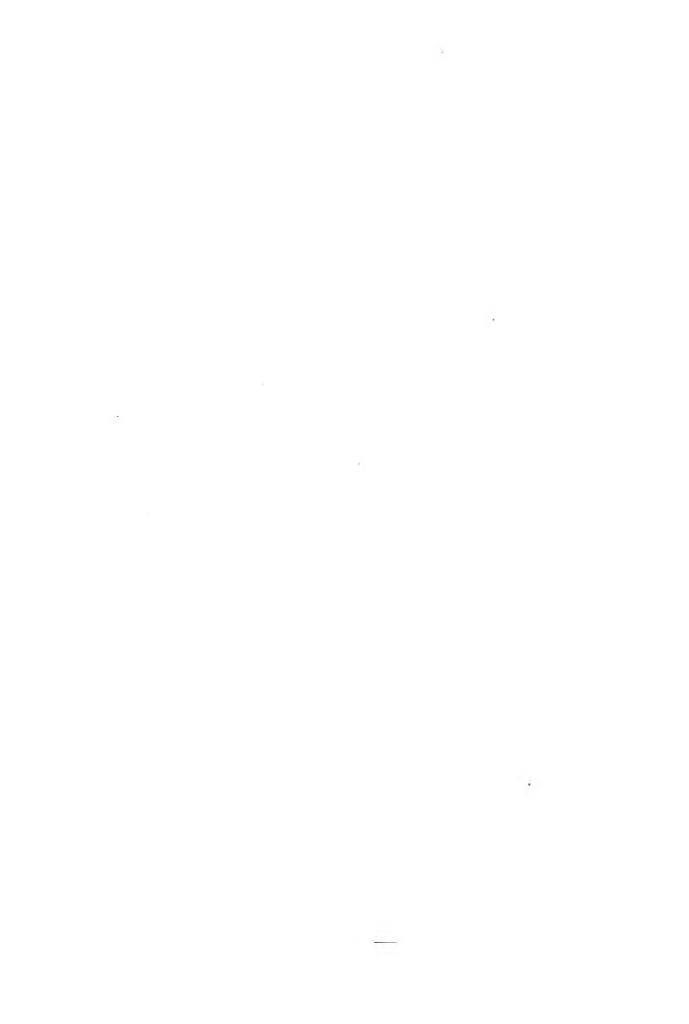






the second				4.	
				*	
		**	(11)		
	*				
		*			
			1		
		*			
	G.				
				-00	





THE NEW TEACHERS' AND PUPILS' CYCLOPAEDIA

A REFERENCE LIBRARY

OF

HISTORY, GEOGRAPHY, BIOGRAPHY, LITERATURE, ECONOMICS, CIVICS, ARTS, SCIENCES, DISCOVERIES

AND INVENTIONS

Editor in Chief

BERNHART P. HOLST

Teacher, Institute Instructor and Superintendent of Schools, Iowa

Associate Editor
HILL M. BELL
President Drake University, Des Moines, Iowa

VOLUME VI

CHICAGO

BOONE

PITTSBURG

TORONTO

The Holst Publishing Company

COPYRIGHT 1909
THE HOLST PUBLISHING COMPANY

COPYRIGHT 1913
THE HOLST PUBLISHING COMPANY

COPYRIGHT 1916
THE HOLST PUBLISHING COMPANY

COPYRIGHT 1918
THE HOLST PUBLISHING COMPANY

H74

tion consisted largely of reading the Koran and extensive drills in military and industrial arts. In 1360 he was made chief of his tribe. His first extensive military experience was in freeing Turkestan from the Kalmucks, who had invaded that region, and he soon required them to recognize him chief in the government of Kesh. His career of conquest was remarkable from the beginning of his reign, overcoming tribe after tribe until he was proclaimed supreme ruler at Samarkand in 1369. Timur, having rising to supreme power in Turkestan, led a powerful army into Afghanistan, captured Herat, and made a triumphant march toward the southwest into Persia. After subduing the Persian chiefs, he invaded Mesopotamia, then Syria and Caucasus, and penetrated into Europe as far as Moscow. By these conquests he extended his dominion from the walls of China to Moscow.

Timur began an invasion of India in 1398 and made Delhi and all of northern India tributary. Subsequently he proceeded east to Burmah, subduing the Burmese prince. However, he soon returned to settle internal disputes at Samarkand, but immediately after commenced an invasion of China. He began his long march with a large army, with the view of reaching the Jaxartes River, proceeding down its course to Otrar, where he was suddenly seized with ague and died. His reign of 35 years is one of the most famous enjoyed by Asiatic rulers, and the cruelty, bloodshed, and devastation committed by his armies are without a parallel in history. He rose from the rank of a petty chief to become the ruler of the region extending from Moscow to Burmah and from the Red Sea to the Altai Mountains. The cities plundered by him include Damascus, Bagdad, Aleppo, and many others of Asia Minor and the region of the Volga. He boasted, "Since there is but one God in heaven, so there ought to be but one lord on earth." Though a cruel tyrant, he patronized science and art, constructed vast internal improvements, gave gorgeous festivals, and is the reputed author of two works, entitled "Autobiography of Timur" and "Institutions of Timur." Some writers question the authenticity of the writings attributed to Timur, since they have been preserved in Persian, and it is quite probable that they were prepared by some scholars closely associated with him.

TIN, a silvery-white and highly lustrous metal. It has a specific gravity of about 7.3. Tin is found in two ores—the native dioxide, called tinstone, and a sulphide of copper and tin, called tin pyrites. The only workable ore is the dioxide. The ore is crushed and the dioxide is separated from the lighter earthy matters by washing in a stream of water, and to expel the sulphur and arsenic the dioxide is roasted in a furnace. In this partially purified state it is mixed with charcoal and fed into a cupola furnace, where the combustion is supported by a blast of air. The reduced tin collects in the re-

fining basins, where it is stirred in order to disperse the gases, which tends to reduce any oxide that has been formed and to bring foreign matters to the surface of the molten metal. The tin is further purified by melting at a moderate heat on the inclined hearth of a reverberatory furnace, and is made to pass into a cavity prepared for it, while the less fusible metals remain on the hearth. It is next cast into blocks, called block tin, while the purest specimens are known as refined tin.

Pure tin melts at 442° Fahr. It burns with a brilliant light when raised to a white heat, and at 212° Fahr. becomes sufficiently ductile to be drawn into wire. Air at ordinary temperatures does not affect it, but it absorbs oxygen when melted, and may be converted into the dioxide by stirring when in the melted condition. Nitric acid converts it into dioxide, giving off torrents of red vapors. A bar of tin produces a peculiar noise when bent, due to the sliding of the crystals over one another. The sound thus produced is called the *cry of tin*.

Tin is probably one of the earliest known metals. It was obtained by the Phoenicians from Sicily and by the Romans from Spain, but the principal tin mines are in England, China, India, Australia, Bolivia, and the Malay Peninsula. Large deposits of native dioxide occur in Bohemia, Germany, Bolivia, Australia, and the Straits Settlements. Limited quantities are obtained in a number of the states, particularly in California and Missouri, but the tin used in the United States is quite largely of foreign importation. In 1914, England produced 4,500 tons of tin; Australia, 7,042 tons; Bolivia, 16,890 tons; and the Straits Settlements, 58,385 tons. In that year the United States imported 75,068,568 pounds, valued at \$19,500,000.

Tin is a highly useful metal, being employed in the manufacture of tinfoil, a product used for enveloping chocolate, tobacco, and other manufactures. It has an important use for tinning iron and copper, which is done by dipping the perfectly clean objects into a bath of molten tin. Its resistance to the action of vegetable acids renders it of economic value in coating knives, forks, spoons, and other household utensils. A number of alloys of tin are utilized, such as plumbers' solder, which is an alloy of tin and lead, and gun metal, bronze, and bell metal, which are alloys of tin and copper. Tin plating is a simpler process than gold plating, but is done similarly, the tinfoil being prepared by rolling cast tin into plates, after which they are beaten and doubled as in goldfoil.

TINDER, a material used for kindling fires before the invention of matches. It is made of half-burned linen, partially decayed wood, and certain fungi, the last named furnishing the so-called *German tinder*. In kindling fires with tinder, it is necessary to have materials that cause sparks by striking, such as a piece of steel with a flint, and the spark is made to ignite the

181

finder, which in turn inflames a match dipped in sulphur.

TINTORETTO (ten-to-ret'to), eminent historical painter, born in Venice, Italy, in 1518; died there in 1594. He was the son of a dyer, hence was called Tintoretto, his real name being Jacopo Robusti. He first studied under Titian, but soon began to paint independently, and may be said to have acquired skill in his profession by his own efforts. The excellent landscapes and portraits painted by him in his studio soon made him famous in Venice, where his works were counted among the most popular. He painted so rapidly and such varied subjects that his fellow townsmen were kept busy examining and discussing the works as they proceeded from his studio. Nearly all the famous collections of Europe include paintings by him, and in the Venetian halls they are still among the most popular. His most famous works are "Belshazzar's Feast," a fresco, "The Miracle of Saint Mark," "The Last Judgment," "The Last Supper," "The Slaughter of the Innocents," "The Worship of the Golden Calf," "The Crucifixion," "Paradise," and "Tiburtine Sibyl." His "Paradise" is one of the largest of biblical paintings, being 74 feet long and 34 feet high, and containing 115 figures.

TIPPECANOE (tĭp-pê-kà-noo'), a river in northern Indiana, which rises in Lake Tippecanoe and, after flowing 200 miles toward the southwest, joins the Wabash eight miles above Lafayette. It was made famous in history by a battle fought on its banks on Nov. 5, 1811, when General Harrison routed the Indians under Elskwatawa, brother of Tecumseh, who was assisted by the chiefs Stone Eater, White Loon, and Winnemac. General Harrison gained considerable prestige in this battle, and when he was a candidate for President, in 1840, the cry "Tippe-canoe and Tyler, too," became popular. Battleground, a village in Tippecanoe County, Indiana, is near the site of the battle. The valley of the Tippecanoe is highly fertile, producing cereals,

grasses, and fruits.

TIPPOO SAHIB (tǐp-poo' sa'heb), or Tipper Sahib, Sultan of Mysore, son of Hyder Ali, born in 1749; died May 4, 1799. His early training was under the supervision of Mohammedans. While in the military service of his father, he came in contact with French officers, who taught him European military tactics. He demonstrated much skill in commanding the native forces against the British at Perimbakum, in 1780, and gained a second victory over them in Tanjore two years later. The death of his father, in 1782, placed him on the throne as Sultan of Mysore, and the following year he reduced the British garrison at Bednore, but the peace between France and England, concluded at Versailles in 1783, induced him to make a treaty of peace with the British. A second war between his forces and the British broke out in 1790, and, when the latter invaded Mysore, he retaliated by invading the region contiguous to Madras. He was finally compelled to sign a peace treaty in 1792, by which he was required to pay 33,000,000 rupees and relinquish half of his territory. An alliance with France was contemplated at the time Napoleon invaded Egypt, and the British immediately declared war upon him and compelled him to retreat to Seringapatam. In the assault upon his capital under General Baird, Tippoo resisted bravely, but was

TIRLEMONT (ter-l'-môn'), a city in Belgium, on the Geete River, 31 miles east of Brussels. It is conveniently connected by railway with European trade emporiums, has numerous manufactures, and is surrounded by a fertile region. Among the noteworthy buildings are the Church of Saint Germain, the Church of Notre Dame du Lac, and the city hall and jail. The city is celebrated on account of a success of the French under Dumouriez over the Austrians in

1793. Population, 1916, 18,540.

TIRYNS, an ancient city of Greece, near the Gulf of Argolis, a short distance southeast of Argos. It belongs to the prehistoric period of the Achaean race and is supposed to have been founded by Proetus, a legendary king of Argolis. The city was the home of Hercules and the refuge of the Cyclops, who built massive walls of solid masonry. Tiryns is thought to have reached its greatest splendor in the 11th and 10th centuries B. C., but it remained a powerful city until 468 B. C., when it was destroyed by the people of Argos. Schliemann made excavations on its site in 1884 and found remains of Greek palaces dating from the 10th century B. C. Some of the finest specimens of Cyclopean architecture extant were secured from its remains, among them a fine frieze of white alabaster. This relic is studded with enamel and glass, and the decorations are interlaced with fine sculptures in relief. Remains of walls and palaces indicate elaborate and substantial stone masonry.

TISCHENDORF (tish'en-dorf), Lobegott Friedrich Constantin von, eminent theological writer, born in Lengenfeld, Germany, Jan. 18, 1815; died in Leipsic, Dec. 7, 1874. He studied theology and philology in the University of Leipsic, where he began to write on biblical themes, and in 1828 published his novel entitled "May Buds." Subsequently he taught as a private tutor in the vicinity of Leipsic, published an edition of the Greek Testament, and spent the period from 1841 to 1844 in examining the principal libraries of Europe with the view of preparing works on theology. He made three trips to the East after 1844, where he visited the principal monasteries and libraries, and subsequently published "Travels in the Orient" and "Views and Sketches of the Holy Land." For these travels and publications he received aid from the government of Saxony and the Czar of Russia.

While in the East he discovered 43 leaves of a

Septuagint manuscript dating from the 4th century, and, together with other valuable manuscripts of antiquity, deposited it in the library of the University of Leipsic. He was made professor of theology and biblical paleography at Leipsic in 1859 and soon after made a journey to Mount Sinai, where he discovered the famous "Codex Sinaiticus" at the convent of Saint Katharine. He was made a hereditary noble by Alexander II., after which he signed his publications as Constantin von Tischendorf, and subsequently he aided in preparing several editions of works to be issued by Baron Tauchnitz. Among his writings not named above are "Evangelica Apocrypha," "Synopsis Evangelica," and "When Were Our Gospels Written?" He contributed to the Vienna Yearbooks and aided others in editing several works in Latin and Greek.

TISSOT (te-so'), James Joseph Jacques, born at Nantes, France, Oct. 15, 1836; died Aug. 9, 1902. He studied in Paris at the École des Beaux Arts, made his first exhibit in 1859, and in 1866 won a medal at the Salon. In 1871 he left France on account of having favored the Commune, and spent twelve years in England, where he became known extensively as an etcher and genre and portrait painter. He went to Palestine in 1886, where he spent ten years in painting, chiefly water-color works representing the life of Christ and views in the Holy Land. These productions are among the finest of their class, representing faithfully and in detail the cities, buildings, and environments of Christ while on earth. Among his chief paintings are "Young Women in Church," "A Young Girl in a Boat," "An Interesting Story," "Meeting of Faust with Marguerite," and "The Captain's Daughter."

TISSUES (tish'ūz). See Connective Tissue. TISZA (te'so). Koloman von, statesman, born in Geszt, Hungary, Dec. 16, 1830; died in 1902. He was liberally educated in the sciences and law and entered the civil service, but, on account of favoring the Revolution of 1848, lost the support of the governing party. In 1855 he received a semiecclesiastical position, and as such officer became known as an opponent of the religious intolerance practiced by the government. In 1860 he was elected to a seat in the parliament of Hungary, where he succeeded Count Teleki as a leader of the opposition. He was long an opponent of the Ausgleich, but in 1875 united with Déak in organizing the new liberal party. He was made minister of the interior in 1875 and before the end of the year became prime minister in the cabinet of Hungary. During the War of 1876-1878, he opposed Russia in its Balkan policy, and for fifteen years was a leading factor in the government of Austria-Hungary. In 1890 he retired from the ministry, but still continued to hold a seat in the parliament and exercised a wide influence.

TITANIUM (tf-tā'nī-tm), a metallic element discovered in 1789, so named from the

Titans. Although it was first discovered by William McGregor, Berzelius was the first to separate this metal in a state of purity. It occurs as a mineral in three forms—as brookite, which crystallizes in the trimetric system, and as anatase and rutile, both of which crystallize in the dimetric system, although with different angles. Titanium is a heavy, dark green powder, and burns with a brilliant white flame. The hardness and strength of steel is increased by adding a small quantity of this metal. It is employed to some extent in the carbon points of arc lamps and to increase the luster of silver. This metal is found in many parts of North America and Europe, especially in Vermont, New Hampshire, New Brunswick, England, and Germany.

TITANS (ti'tanz), in Greek legends, the powerful sons and daughters of Uranus (heaven) and Gaea (earth). Hesiod mentions the male Titans as Cronus, Oceanus, Crius, Coeus, Iapetus, and Hyperion; and the female Titans as Rhea, Theia, Phoebe, Themis, Tethys, and Mnemosyne, to whom some writers add Dione. They were urged by their mother to form a conspiracy under Cronus against their father because he had assigned the Giants to Tartarus, the portion of the lower world that served as the subterranean dungeon of the gods. A wound inflicted upon Uranus caused the blood to flow profusely upon the earth, and from it sprang a race of monstrous beings called Giants. Cronus, assisted by his fellow Titans, succeeded in dethroning his father, who, enraged at his defeat, foretold that a similar fate would fall upon his rebellious son. On being invested with supreme power, Cronus assigned all the Titans' offices to persons of distinction, making them subordinate only to himself. However, when once secure in his position, he made war upon his assistants and allies and, with the help of the Giants, succeeded in sending those that resisted his authority into the lowest depths of Tartarus. Subsequently Zeus overthrew all the Titans and confined them in a dungeon below Tartarus, where they were guarded by Hecatoncheires, meaning the hundred-

TITHES (tithz), a tax of one-tenth of the profit derived from the use of land. The name is from the Anglo-Saxon word teotha, meaning a tenth part. Formerly tithes were levied very extensively for the assistance of the poor and to support religious worship, but at present this form of taxation is not in extensive use. It is mentioned in Gen. xIV, 20, and was levied among the Jews to support the Levites, the priestly The second council of Tours, in 567, passed the first enactment for that purpose, and it was afterward enforced under pain of excommunication. Later other countries of Europe established this system of taxation, the first constitutional decree of a synod in England dating from 786. After that time all the lands, except those of the crown and of the church itself, were tithable, but after the Reformation many of the

church lands were exempted as a condition of sale of these lands to private owners. These partial exemptions caused those who were required to pay the taxes to become dissatisfied and they made a complaint for two centuries. Since the year 1200 all landowners in England have been required to pay tithes for the support of the clergy in their respective parishes, but the payment is now in money instead of a part of the products.

The Roman Catholic clergy collect tithes in Quebec, under a French law which is still enforced. No tithes were ever levied in the United States, except by the Mormon church, which levies tithes under a system that is modeled after the Jewish law. Some Protestant denominations, as the Adventists, voluntarily pay one-tenth of their income to the support of the

church.

TITHONUS (tǐ-thō'nŭs), in Greek legend, a brother of Priam. He was carried off by Aurora (the Daion), who bore him Memnon. Later he received from the gods the gift of immortality. Homer relates that Aurora forgot to ask the gods to bestow eternal youth upon him, hence he became helpless in old age, but was finally

transformed into a cicada.

TITIAN (tish'an), or Tiziano Vecellio, distinguished painter of the Venetian school, born in Pieve di Cadore, Italy, in 1477; died in Venice, Aug. 27, 1576. He displayed remarkable interest in art and painting pictures in color while yet a child, and was taken to Venice by his father, where he studied under Giovanni Bellini and other artists. Giorgione was his fellowstudent and friend, and at his death, in 1511, Titian finished some of his pictures. The styles of Titian and Bellini were very similar, and the painting entitled "Homage of Frederick Barbarossa to Pope Alexander III.," begun by the latter, was finished by Titian with remarkable trueness to the basic work. He was invited to Padua in 1511, where he executed several famous frescoes still well preserved. In 1523 he frescoed "Saint Christopher Carrying the Infant Christ" in the ducal palace of Venice, and in 1532 painted at Bologna a portrait of Emperor Charles V., receiving for the latter an appointment as Count Palatine and Knight of the Golden Spur.

He accompanied Charles to Spain soon after and spent three years in Madrid, where a number of his masterpieces are in a good state of preservation. In 1550 he executed the portrait of Philip II. of Spain, who patronized him as warmly as had his immediate predecessor, and about the same time he completed the famous group containing paintings of Pope Paul II., Duke Octavio Farnese, and Cardinal Farnese. Titian worked incessantly to an advanced age, and the frescoes and paintings executed by him are very numerous. They exhibit remarkable accuracy in coloring and fine inventive skill. His landscapes, portraits, frescoes, and sacred objects

take an equally high rank. Among those of note not mentioned above are "The Virgin and San Tiziano," "The Assumption of the Madonna," "Christ in the Garden," "David and Goliath," "Descent of the Holy Ghost upon the Apostles," "Venus and Adonis," "Saint Margaret with the Dragon," "Victory of the Venetians over the Janizaries," "Martyrdom of San Lorenzo," "Christ Crowned with Thorns," "The Virgin and Child with Saints," and "Diana and Her Nymphs."

TITICACA (tĭt-ē-kä'ka), a lake in South America, on the boundary between Peru and Bolivia, about 200 miles from the Pacific. The length is 130 miles; width, 35 miles; and elevation above sea level, 12,575 feet. It receives the inflow from many small streams, but has no outlet to the sea, discharging into Lake Aullagas, from which the water finally evaporates in salt marshes. The lake abounds in valuable fish and contains a number of islands. It has an area of 3,275 square miles. In the vicinity of the lake and on a number of the islands are ruins dating from the prehistoric period of America, the extent and workmanship of which give evidence of a higher civilization than that found when the region was explored by the Spanish. Some of the ruins contain remnants of substantially constructed walls, finely sculptured blocks of stone, and figures of men and animals cut on the sides toward the interior. The lake was navigated by steamboats as early as 1871, the vessels being carried across the country in pieces and put together at the lake shore. Several railroad lines now extend to the vicinity of the lake, one from Cuzco and another from Arequipa. Puno is the principal railroad town and lake port on the western shore.

TITLARK (tĭt'lärk), or Pipit, a class of birds resembling the larks both in habit and appearance, closely allied to the wagtails. The meadow pipit is the smallest and most widely distributed of the species. It is dark olivebrown, with greenish markings on the upper parts, and brownish-white beneath. The greenish tint on the back becomes more conspicuous in the autumn. Its body is about six inches long, the wings are very long, and the tail is slightly notched. The nests are built on the ground, usually in a tuft of grass. Another species common to America is the so-called American titlark, which closely resembles the water pipit of Europe. These two species are the only ones native to America, but there are fully fifty species in the genus, and representatives are found in nearly all countries of the world. They usually lay five or six eggs, both sexes incubating.

TITLE, in law, the term used to designate ownership of property, based upon all the elements which constitute title to real estate or personal property. It involves the elements of possession and the right of possession, and is based either upon title by descent or by purchase.

Inheritance is the single mode of acquiring title by descent, while all other methods refer to title by purchase. However, the death of the owner operates to transfer property in various modes, which may be classed as by will, by descent without will, by occupancy, and by verbal gift, though the amount transferred by the last mentioned method is limited to personal property.

Title by purchase is based upon original acquisition, as by finding or government grant; lapse of time, as by possession for a certain length of time; eminent domain, as taking land for public use; and conveyance, as by gift or sale. In the sale of real estate it is essential to examine the title set out in a statement called an abstract of title. Such a statement contains a complete history of all the transfers that have been made from the beginning or from some public act, as of a legislature. It shows whether any taxes or assessments are unpaid, what mortgages or judgments affect the title, and the nature of the title of the grantee in the property. An abstract of title is required under the law of England, and it is usually given voluntarily in Canada and the United States.

The term *title* is applied in legislation to that part of an act by which it is known and distinguished from other acts. It is a requirement in most states and countries that the subject of every act be expressed in the title thereof. The term *title* is applied in pleading to the words whereby a particular suit at law is designated. It consists in most cases of the name of the court, the venue, or place of trial, and the parties to the same.

TITLES OF HONOR, the designations by which persons are addressed in consequence of some office or dignity in their possession or inherent in them. They were used to a limited extent among the Greeks, but the Romans bestowed them more freely upon their public officials. The honorary title of Magnus pertained to the descendants of Pompey, while those of Africanus and Asiaticus had reference to those who descended from Scipio. Some offices carried their titles with them, independent of the merits or services of the incumbent, as the words Caesar and Augustus. These originally were family names, but they came to be applied to all who held the imperial throne of Rome.

Many titles are in use at present, but they are confined chiefly to monarchical governments. Those applied to chief rulers are termed sovereign titles, as King of England and Emperor of Austria. The Russian title Czar and the German title Kaiser were derived from Caesar and correspond to emperor. Mikado is the title used in Japan, and Sultan and Shah are sovereign titles of Persia and Turkey. Minor titles include duke, prince, marquis, archduke, viscount, baron, knight, baronet, esquire, and chevalier. It is customary to prefix certain terms before the title, as majesty, royal highness, his excellency, etc.

TITMOUSE (tit'mous), or Tit, a subfamily of birds belonging to the warblers. They are remarkable for their boldly defined color, quick movements, and skill in flitting from tree to tree. They feed on grain, seeds, and insects, catching the last named while on the wing. The female defends its nest and young with much courage. It has been observed that a pair of blue tits carry flies and other pests to their nests every few minutes, thus making them extremely serviceable in the destruction of obnoxious insects, especially caterpillars. The American species include the tufted titmouse, the chickadee, the bush tit, and the verdine. The tufted titmouse is the largest of the American species and the verdine is one of the most beautiful, having a yellow head and chest and a grayish back. Among the species native to Europe are the blue tit, called also tomtit, the great titmouse, the hanging tit, and the bluecap tit. Most tits have a shrill and wild voice, but imitate the voice of other birds.

TITUS (tī'tŭs), an assistant and disciple of Paul, to whom the latter addressed the Epistle to Titus, one of the three pastoral epistles of the New Testament. He was of Greek birth and was probably converted at Antioch in 51 A.D., when Paul preached in that city, and later accompanied him from that place to Jerusalem. It is believed that he was present at the first council that recognized Gentile converts as part of the church and exempted them from certain burdens of the Mosaic ritual, this being attested by Paul's refusal to require Titus to be circumcised. Paul subsequently sent Titus to Ephesus, in 56, and later to Corinth. According to tradition, Titus became the first Bishop of Crete, where he died a natural death at an advanced

TITUS, Arch of, a triumphal arch on the Sacred Way, in Rome, facing the Forum. It was erected in 81 A.D. by Domitian to commemorate the capture of Jerusalem by Titus. The material used is chiefly Pentelic marble. It is adorned with reliefs to represent the triumph of Titus, and contains a representation of the seven-branched candlesticks and the shewbread upon the table.

TITUS, Epistle to, a book of the New Testament, written by Saint Paul to Titus. It is included with the two epistles to Timothy in the writings termed pastoral letters. Titus appears to have been left in Crete, and the apostle laid down certain rules of conduct and warned him against certain false teachers. He describes the virtues that become all classes, warns against idle speculations, and encourages obedience, gentleness, and moderation.

TITUS, Flavius Sabinus Vespasianus, emperor of Rome, eldest son of Vespasian, born in Rome, Italy, Dec. 30, 40 a. d.; died Sept. 13, 81. He was brought up at the court of Nero, where he secured the benefits of a liberal education in literature, history, and philosophy, and became

noted as an accomplished scholar. He was given a military appointment in Germany and Britain, and later served under his father in Judea as commander of a legion. Vespasian became emperor in 69 and Titus remained in Asia to conduct the Jewish war, which ended by the capture of Jerusalem in 70. He visited Arabia and Egypt soon after, returning thence to Rome, where he was given a triumph by the joyous populace. His father made him joint ruler of the empire, and on the death of the former, in 79, he succeeded to the Roman throne.

Titus disappointed the people in the early years of his government by acts of tyranny and by spending much time in pleasure, but when he succeeded to full control his government became one of marked justice and liberality. He invited scholars to Rome, corrected many abuses in the civil service, erected splendid public buildings, constructed the Colosseum and the Baths of Titus, and instituted great public games. The celebrated eruption of Vesuvius, in 79, buried Pompeii and Herculaneum, and the following year a widespread fire destroyed many of the finest buildings of Rome, including the capitol and Pompey's theater. These calamities were followed by a dreadful pestilence. Titus immediately opened the public treasury to relieve the suffering of the people, and even spent his own fortune that their hardships might weigh less heavily upon them, thus making himself one of the most benevolent and philanthropic rulers of Rome. His death occurred in his villa at Reate, in the Sabine country, and he was succeeded by his brother, Domitian. He is the accredited author of poems and tragedies in the Greek.

TITUSVILLE (tī'tŭs-vĭl), a city of Pennsylvania, in Crawford County, 18 miles north of Oil City, on the Pennsylvania and the Dunkirk, Allegheny Valley and Pittsburg railroads. It is finely located on Oil Creek and is the center of a coal and oil producing region. Among the features are the high school, the public library, the city hall, several large oil refineries, and a number of fine schools and churches. The manufactures include machinery, stoves, hardware, chemicals, oil, and earthenware. It has good municipal facilities, such as sewerage, waterworks, electric lighting, and street pavements. The first

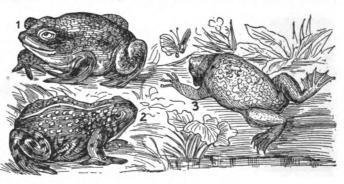
oil well in the United States was sunk and operated here in 1859. Titusville was settled in 1796 and chartered as a city in 1866. Sixty lives and much property were destroyed by a flood and fire in 1892, when several oil tanks were burned. Population, 1900, 8,244; in 1910, 8,533.

TIVOLI (tiv'o-li), a city in Italy, on an elevated slope of Monte Ripoli, 17 miles northeast of Rome. It occupies a site on the Teverone

River, the ancient Anio, which joins the Tiber near Rome. The streets are mostly narrow and tortuous, but it has a number of fine buildings, among them the cathedral, known anciently as the Temple of Hercules, which served as a court in the time of Augustus. Near the Teverone River, which has a magnificent falls at Tivoli, is the Temple of Vesta, a structure dating from 70 B. C. In its vicinity are remains of baths, mausoleums, aqueducts, and villas dating from the time of the Roman emperors, especially that of Hadrian. The city is thought to have been founded in 446 B. C. and is mentioned in the poems of Virgil, Propertius, Horace, and Catullus. It was a favorite resort of Numidicus, Scipio, Marius, and other Romans. Here Queen Zenobia of Palmyra and King Syphax of Numidia spent their last days. Beautiful gardens, orchards, and vineyards surround it, giving the city a most pleasing appearance, especially when the orchards are decked with flowers in the spring and laden with fruit in autumn. Population. 1916, 12,108.

TOADFLAX, a genus of plants found in the temperate and colder regions. It grows both in fields and highways, and in some sections is considered a troublesome weed. The stem is from one to three feet tall and has narrow leaves. The yellowish flowers appear on a terminal spike. Locally it is called snapdragon and butter-and-eggs.

TOADS, a genus of tailless amphibians allied to the frogs, but differing from them in having a thicker and more clumsy body. The hind legs are short and the toes are slightly webbed, thus making it impossible to leap with facility. The common toads have toothless jaws



TOADS.

1, Common toad; 2, Natterjack toad; 3, Surinam toad.

and rounded muzzles, and the skin is covered with warts containing glands that secrete a yellowish, irritant fluid. They spend most of their time in moist and shady places, but come out in the evening in search of food, which consists of insects, worms, and small shelled animals. The winter is spent in a hole or other place of hiding, in a torpid state, from which they emerge after the return of warm weather in the spring.

They are scarcely able to swim, their feet being insufficiently webbed, and they take to water only to deposit their eggs. The eggs are laid in spring and are fertilized externally at the moment of extrusion, and, like those of the frog, are held in a gelatinous tube or envelope, which is coiled spirally in the water. Tadpoles similar to those of the frog soon develop, and they become toads on shedding their gills and tails. Toads are useful for the destruction of insects and grubs in gardens, which they catch by suddenly protruding the tongue, and for that purpose are kept in some of the larger gardens and hothouses. They may be tamed and trained to act with considerable intelligence. Many widely different species have been described. They are found in all the continents and larger islands, though their occurrence is rare in Australia and Ten species are native to North the Celebes. America.

TOBACCO (tō-băk'kō), a widely cultivated plant of the nightshade order, belonging to the genus Nicotiana Tobacum. The upright stem of



TOBACCO IN BLOOM.

the common tobacco plant grows to a height of three to five feet, has lance-shaped leaves fully five to eighteen inches long, and bears rosecolored and terminal flowers. The stem and leaves are covered with hairs, which are glandular and viscid at the tip. All species possess narcotic properties, for which some are cultivated extensively in the tropical and temperate zones. Tobacco is native to the tropical regions of America, and was unknown in Europe prior to the discovery of the New World by Colum-The genus is called Nicotiana from a Frenchman named Jean Nicot, who sent seeds of the plant to France in the time of Catherine de' Medici. It probably came to be called tobacco from Tobaca, an island near Trinidad, whence a Spaniard introduced it into Portugal and

Spain in 1559. From the Spanish peninsula it was successively introduced into France, Germany, Denmark, and England.

Uses of Tobacco. The smoking of tobacco was practiced in America at the time of its discovery, but the plant was first used in Europe in the form of snuff, smoking being introduced later by Sir Walter Raleigh. The use of tobacco was opposed by many priests, sovereigns, and learned men, and the practice was met by the severest opposition. Users of tobacco were tortured in Russia, executed in Turkey, and fined and imprisoned in Switzerland, and Popes Urban VIII. and Innocent IX. issued bulls against it. James I. of England published a proclamation against the use of tobacco, describing it as harmful to the brain, hateful to the nose, dangerous to the lungs, and injurious to the eyes. However, the tobacco habit spread alike to the high and low, among the Christians and Mohammedans, and in fact among all classes and in all countries. In America and most European countries the nature and harmful effect of tobacco upon the human system are taught in the schools in connection with the subject of physiology, and it is hoped that under a system of rational instruction the habit of using it will be entirely eradicated among the young, as well as limited generally.

CULTIVATION. The two classes of tobacco that are most extensively cultivated are the Virginian and the green tobacco, but allied species have been obtained by propagation. It is aimed to select for commercial cultivation the plants bearing the largest and most numerous leaves, though hardiness in enduring the climate is also an objective point. The seeds are sown early in the season in beds, and when the young plants are about four inches high they are transplanted in a field containing rich soil. Transplanting takes place about the early part of May, this depending upon the latitude and season, since the plants are easily affected by frost. The young plants are placed in the ground in rows about four feet apart, thus facilitating cultivation by machinery. It is necessary to guard against injury by insects, especially the tobacco worm, a caterpillar which is fond of the leaves. The stalks are topped and freed from false leaves or suckers appearing at the bottom, the purpose being to direct the growth of the plant so as to develop the largest

leaves possible.

The plants mature in about three months after being transplanted, and they are then cut immediately above the ground and hung in the tobacco barn with heads downward. Tobacco barns are buildings with the sides and ends open, thus allowing the air to pass through freely. In some countries the barns are inclosed and the plants are dried by means of artificial heat, usually 100° at first, and later the temperature is raised to 175°. The portion having a light and even color is considered of the finest flavor and brings the highest price in the market. When thoroughly dried, the tobacco is crated and transported to the manufacturer.

Tobacco is grown in North America chiefly from Florida to Wisconsin and along the Atlantic coast as far north as New Brunswick. However, the finest quality comes from Cuba. Other countries that yield large quantities include China, Austria-Hungary, Russia, Germany, France, Borneo, the Philippines, Ceylon, Brazil,

Spain and Australia.

MANUFACTURE. The manufacture of products from tobacco is one of the great industries, involving a large capital and employing many thousands of laborers. When taken to the factory the leaves are cleansed with salt and water and the midrib of the leaf is removed. The largest and finest cured leaves are set aside for cigars. Other grades are used for smoking tobacco and for snuff. Snuff is made largely of the midrib, and the inferior grades of smoking tobacco are obtained from the smaller leaf ribs and waste in cigar making. Plug, or chewing, tobacco is chiefly manufactured from a middle class of leaves, which are moistened and pressed into cakes or sticks. Cheroots are made by rolling leaves in the shape of a slender cone, and cigarettes, by inclosing small particles of tobacco in a tubular paper wrapper. It is estimated that 875,000,000 people use tobacco and that the total annual consumption of the world reaches 1,250,-000 tons. The annual consumption in the United States is given at 490,000,000 pounds. Large quantities of cigars are smoked in Canada and the United States, while snuff, cigarettes, and pipe tobacco are used more commonly in Europe. Tobacco is consumed more extensively as a sedative, or narcotic, than any similar substance, but it is rivaled by opium and next by hemp.

TOBACCO WORM, an insect which attacks and destroys the leaves of tobacco. It is the larva of a large green caterpillar, but is known as the tobacco worm while in the larval state. The pupa of this insect lies dormant in the ground during winter and the caterpillar comes out in May or June, when it begins to lay eggs on the under side of the tobacco leaf. As soon as the larvae hatch they begin to feed upon the plant, and do much damage by feeding vigorously. One or two broods appear each summer, depending upon the region where the

tobacco is grown.

TOBAGO (tō-bā'gō), an island in the West Indies, situated 20 miles northeast of Trinidad and classed with the Windward group. The area is 114 square miles. It is of volcanic origin, has peaks elevated about 2,000 feet above the sea, and the general surface is mountainous. A large part of the island has a fertile soil, suitable for the cultivation of coffee, cotton, tobacco, and sugar cane. The plants resemble those of Trinidad and the northern part of South America. Columbus discovered the island in 1498. It was settled by the Dutch in 1632, but has been a British possession since 1763. For the purpose of

government it is a dependency of the colony of Trinidad. Scarborough is the capital and principal port. About 200 of the inhabitants are

whites. Population, 1916, 18,858.

TOBOGGAN (tō-bŏg'gan), a vehicle for coasting upon the snow and ice. It differs from a sled in that the bottom is flat and is not provided with runners. Toboggans were used originally by the Indians of Canada to convey dead game over the new snow. They constructed these vehicles of slabs of birch. This mode of construction gave them the advantage of light vehicles that could be pulled easily over loose snow and even over rough ground. Strips of whalebone are used for making toboggans among the Eskimos, and some tribes employ dried bark.

Toboggans for sporting purposes are made chiefly of thin strips of wood, such as ash or maple, and are about eighteen inches wide and six to ten feet long. They carry from two to The vehicle is taken to the four occupants. upper end of a slideway, consisting of one or more chutes, covered with snow or ice. The speedway is from 500 to 900 yards long and inclines sufficiently to permit attaining a great speed. In some cities toboggan slides are constructed in parks for the free use of children, who may use either sleds or toboggans. However, in some localities tobogganing is a private enterprise and those who take part in the pastime pay a small fee.

TOBOL (tå-bôl'y'), a river of Asia, in Western Siberia. It rises in the southern part of the Ural Mountains, has a general direction toward the northeast, and discharges into the Irtish near Tobolsk. The Tobol is about 745 miles long and is navigable about half that distance.

TOBOLSK (tō-bŏlsk'), a city of Siberia, capital of the government of Tobolsk, at the confluence of the Tobol and the Irtish. It is on a branch of the Trans-Siberian Railway, about 300 miles northwest of Omsk, and is the center of a large trade in furs, fish, and live stock. The chief buildings include the museum, a seminary, a gymnasium, and several churches. A monument erected to the memory of Yurmak, a Russian pioneer in Siberia, stands in the public square. It has manufactures of soap, leather, clothing, cured meat, and sailing vessels. The city was founded in 1587, hence is one of the oldest Russian settlements in Siberia. Population, 1918, 20,500.

TOCANTINS (tō-kān-tēns'), a river in Brazil, which rises in the government of Goyaz by several branches, and, after a course of 1,575 miles toward the north, flows into the Atlantic by the estuary of the Rio Pará. The principal tributary is the Araguayá, which it receives in latitude 6° south. It is eight miles wide at its mouth, and the tide affects it fully 300 miles from its mergence into the Pará. Boats ascend it for 1,025 miles, but navigation is obstructed in several places by extensive falls and rapids, particularly between the Araguayá and the Pará.

The valley is fertile and contains fine forests of valuable timber.

TOCQUEVILLE (tŏk'vĭl), Alexis Charles Henri Clérel de, author and statesman, born in Paris, France, July 29, 1805; died April 16, 1859. He descended from a noble family of Normandy, and, after studying law, became a successful advocate. In 1830 he was made assistant magistrate, and the following year was sent to the United States by the French government to inspect prisons and reformatory institutions. On returning to France two years later he published "Democracy in America," an able work devoted to the description of American institutions. In 1839 he entered the chamber of deputies, where he exercised considerable influence in legislative affairs. He became vice president of the assembly in 1849, served as minister of foreign affairs for a short period, and after the ascension of Napoleon III. to the throne of France, in 1851, he retired to his estate. Tocqueville was made a member of the French Academy and of the Academy of Moral Sciences.

TODLEBEN (tôt'lā-ben), Franz Eduard, general and engineer, born at Mitau, Russia, May 20, 1818; died at Soden, Germany, July 1, 1884. He descended from German parents, studied engineering at Saint Petersburg, and in 1838 entered the army. From 1848 to 1851 he served as a military engineer in the Caucasus, where he defeated a native army under Shamyl. He was placed at the head of the staff of General Schilder-Schuldner in 1853, and when that general became wounded at the siege of Silistria he succeeded to the chief command and was transferred to the Crimea. His services in the defense of Sebastopol made his name famous. As a military leader he possessed great fortitude and ability, and was efficient in supervising the construction of fortifications. In 1860 he was made chief of engineers in the Russian army and in 1878 was given charge of the siege at Plevna, where he captured a large Turkish army under Osman Pasha. Subsequent to the war he became governor of Odessa, but retired to a health resort in Germany in 1884, dying shortly after.

TODY (tō'dy), a genus of birds found in the West Indies, related to the bee-eaters and kingfishers. The bill is long and much depressed, the wings are short and rounded, and the tail is quite short. Most of the species are small birds, not more than three inches in length, and the plumage is richly colored with green and red. The common green tody is native to Jamaica and is frequently called robin redbreast. Several species are found in the northern part of South America. These birds frequent damp places, living alone most of the time, and feed upon insects and the tender part of plants. They are easily approached and caught, being somewhat dull and stupid.

TOGA (toga), a popular garment worn by the Romans, constituting the principal outer

article of attire. While it differed somewhat in fashion at various periods, the general form was semicircular. One corner of the garment was placed upon the left shoulder and the remainder passed behind the body, over the right shoulder and across the breast, the end being thrown back over the left shoulder. The garment reached nearly to the feet, behind the wearer. The togas worn by officers were made chiefly of white woolen cloth, while children and both sexes wore patterns in white with a broad purple border. After the introduction of the sola, that garment was assigned to the women, while the toga became the peculiar distinction of Roman men. Exiles and foreigners were not permitted to wear it. In the home the tunica was regarded sufficient, but the toga was worn out of door, and later more convenient garments of foreign origin were added to the costume.

TOGO (tō'gō), Heihachiro, naval commander, born in Japan in 1847. He received training at the national naval school at Heiga-

kuryo and subsequently in England, at the Thames Nautical Training College. By successive promotions he rose to the rank of rear admiral, and in the war with China in 1894-1895 he commanded the Naniwa. He was commander in chief of the Japanese fleet during



HEIHACHIRO TOGO.

the Russo-Japanese War of 1904-1905, and had personal charge of the squadron that annihilated the Russian Baltic fleet under Admiral Rojestvensky in the Sea of Japan, May 27-28, 1905. His successful exploits entitle him to distinction as the naval hero of the war.

TOGOLAND (to'go-land), a colonial possession of Germany, situated on the Gulf of Guinea, between Dahomey and Ashanti. The coast is only 32 miles long, but inland the country broadens considerably. It has an area of 33,750 square miles. The Volta River forms a part of the western boundary and is the principal stream, but there are numerous others of more or less importance. The country has a general rise from the coast toward the inland, the surface being low and level along the gulf and considerably elevated in the northern part. Among the principal productions are coffee, maize, wheat, rye, barley, ivory, palm oil, gums, and many varieties of fruits. Fine forests are abundant, including the rubber tree, oil palms, cocoa, and dyewoods. The native manufactures embrace textiles, pottery, clothing, and utensils. Togoland has a considerable trade in native products, and imports cotton goods and machinery. The colony is not only self-supporting, but yields a fair revenue. The government is administered by a residential imperial commissioner. Lomo is the chief port and capital. Togo is the principal native town. Togoland became German territory in 1884; the British captured it in 1916. Population, 1917, 2,050,540.

TOKAT (tō-kāt'), or Tocat, a city in Asiatic Turkey, in the vilayet of Sivas, about 60 miles south of the Black Sea and 375 miles southeast of Constantinople. It occupies a site among elevated hills, thus giving it an almost unbearable heat in the summer. The region is noted for its extensive gardens and vineyards. Tokat has a considerable trade in merchandise, fruits, camels, and textiles. The streets are mostly narrow and tortuous. Besides several cotton printing and dyeing institutions, it has several smelters for iron and copper ore. A large majority of the inhabitants are Turks. Population, 1916, 31,465.

TOKAY (tô-kā'), a town in Hungary, at the confluence of the Bodrog and Theiss rivers, 41 miles north of Debreczin. It is noted for a kind of wine made from grapes grown in the vicinity, the product being known in the market as Tokay wine. Vast vineyards cover the regions adjacent to the town, fully 18,000 acres being utilized for grape culture. The wine made from the Tokay grapes is of a greenish hue and possesses a fine flavor and an agreeable taste. Imitations of this grade of wine are sold in the market. Fully 1,575,000 gallons of Tokay wine are produced annually, and large quantities of it are exported to foreign countries. The town is unimportant, having a population, in 1916, of 5,870.

TOKIO (to'ke-o), or Tokyo, formerly Yeddo, the capital and most important city of Japan, on the island of Hondo, separated into two parts by the Sumida River, which discharges into the Bay of Tokio at this place. It occupies a fine site on the north shore of the Bay of Tokio, has railroad facilities, and is one of the best built cities of Asia. Most of the streets are wide and regularly platted, crossing each other at right angles. They have substantial pavements and are lighted by gas and electricity. It has an extensive system of waterworks, telephones, and sewerage, and the streets are kept clean and free from rubbish. Among the principal buildings is the court of the Mikado, who has his residence at Tokio. Among the noteworthy buildings are the mansion of the Barons of Mito, the public library, the Imperial Museum, the Temple of Sankakuji, the city hall, and the customhouse. The city contains a large number of Shinto shrines and Buddhist temples, about 800 elementary schools, and the national university. It is famous for its fine parks and gardens of flowers.

Tokio has a vast system of electric railways and large railroad and machine shops. Among the manufactures are silk goods, cotton and woolen textiles, paper, carriages, vehicles, sailing vessels, machinery, clothing, toys, and chemicals.

The interior and foreign trade is considerable. The harbor, being both commodious and secure, is the seat of much activity in commercial enterprises, having steamship connections with the chief ports of the world. It has a large wholesaling and jobbing trade, both with the cities of Japan and Corea. The government is administered by a mayor, a municipal council, and a municipal assembly.

Yeddo was made the seat of the Japanese government by Iyeyasu in 1600, since which time it has continued to be the principal seat of governmental and social influences. The name was changed to Tokio in 1868, when a revolution displaced the Shogun government and established the court of the Mikado. Commodore Perry concluded a treaty between the United States and Japan in 1854, by which it became open to foreign trade. Formerly the foreign legations were confined to particular parts of the city, but the extra territoriality has been abolished. Population, 1910, 2,186,079.

TOKIO, University of, an institution of higher learning founded at Tokio, Japan, in 1868, by the union of two schools. This institution is the outgrowth of extensive reforms in politics and social affairs, and occupies a high place in the educational system of the country. It is supported by the government, under the administration of a board of councilors. The departments include those of the sciences, law, medicine, and engineering. Originally it had a faculty composed largely of foreigners, or natives trained in Europe, but at present instruction is almost exclusively in the hands of Japanese. It has a fine library, an observatory, and modern apparatus. The attendance is 5.250 students. TÖKÖLY. See Tekeli, Emeric.

TOLEDO (to-le'do), the third city of Ohio, county seat of Lucas County, on the Maumee River, 90 miles west of Cleveland. It is on the Wabash, the Grand Trunk, the Michigan Central, the Père Marquette, the Pennsylvania, the Lake Shore and Michigan Southern, the Cincinnati, the Chicago and Saint Louis, and other railways. Large vessels navigate the Maumee through the city, and it has an extensive harbor on Maumee Bay. Steamships of the largest size enter the city, furnishing direct communication with the leading ports of the Great Lakes. About 25 miles of docks are maintained in the harbor, a large part of which is devoted to ore and coal. A number of bridges span the river, which averages a half a mile in width, and a system of electric street railways furnishes com-

The city has an area of about forty square miles, extending on both sides of the river, and the business section is built largely upon ground that has been improved by grading. Originally the ground near Lake Erie and along the river was a swamp, while the settlements were made

munication with all parts of the city. A number

of the electric lines extend inland to points

within the State.

chiefly on two hills. However, extensive improvements have made the site safe and beautiful. Shade trees ornament the residential portions and the streets are paved largely with stone, brick, and asphalt. The parks include 850 acres. Walbridge Park, on the west side, has a fine herbarium and zoölogical gardens. View Park is at the point where the river enters the bay, Riverside Park is farther upstream, and Navarre Park is on the east side. Other pleasure grounds include Collins Park, Ottawa Park, and Central Grove Park. A system of boulevards leads to the outlying parks. The city has a public cemetery that is self-supporting, and other burial grounds are maintained by private interests.

The county courthouse is located in a beautiful park in the central part of the city, which contains a fine statue of President McKinley. Other public buildings of note include the public library, the Masonic Temple, the Soldiers' Memorial Building, the Valentine Theater, the Saint Paul's Church, the Saint Patrick's Church, the Toledo Club, and numerous office buildings. The city has about fifty public schools, including several high schools, and is the seat of a State normal school. It has the Toledo Medical College, the Saint John's College, and numerous hospitals and private educational institutions. A gallery of paintings is maintained by the Museum of Art. The public library contains 50,500 volumes.

Toledo has a large commercial and jobbing trade. It receives iron ore and lumber from the Lake Superior region of the Great Lakes, and is a distributing point for coal mined in Ohio and Pennsylvania. A fertile farming country is tributary to it, hence it is important as a market for grain, live stock, fruits, and vegetables. Among the larger industrial plants are wagon factories, blast furnaces, machine shops, glass works, breweries, and steel and iron foundries. The general manufactures include automobiles, clothing, earthenware, plate and cut glass, cigars, bicycles, flour and grist, scales and balances, and farming implements. The city has extensive systems of waterworks, sanitary sewerage, and gas and electric lighting.

The site of Toledo was formerly occupied by the Miami Indians, who made it a central point for hunting and trading expeditions. men made the first settlement in 1832 and the city was chartered five years later. Both Ohio and Michigan claimed the surrounding territory, and the controversy is usually known as the Toledo War, though it consisted only of a prolonged discussion of legal points. The settlement of the State and the construction of the Wabash and Miami canals mark the beginning of its rapid growth. About one-fifth of the inhabitants are of foreign birth, chiefly Germans, Irish, and Scandinavians. Population, 1900, 131,822; in 1910, 168,497.

TOLEDO, a city of Spain, in a province of

the same name, on the Tagus River, 54 miles southwest of Madrid. It is centrally located on a number of important railroads and is surrounded on three sides by the Tagus, which flows through a region of hills and constitutes a means of defense. The side not inclosed by the river is secured by strong walls, the inner of which was built in the 7th century by the Gothic king Wamba, and the outer wall was constructed in 1109 by Alfonso VI. The streets are narrow and tortuous and wind over the hills. They are illy paved. Among the most noted buildings is a fine Gothic cathedral, completed in 1492, and in the same vicinity are several large convents and It has a number of government buildings, hospitals, secondary schools, and ruins of a palace and fortress dating from the 16th century. Toledo was once a city of much commercial importance, but at present it has only a limited trade and few productive industries. The leading manufactures comprise the Toledo blades, a class of swords renowned for their fine temper for more than two centuries, but these are made under government supervision. Other manufactures include machinery, woolens, leather, paper, guitar strings, utensils, chemicals, and clothing. Toledo is a very ancient city and is intimately connected with the history of Spain. The Romans under Marius Pulvius captured it in 192 B. C., when it was important as a strategic and commercial point, and it was taken by the Moors in 714 A.D. Castile annexed it in 1085. The French occupied it from 1808 to 1813. It contained 200,000 inhabitants when in the height of its prosperity. Population, 1916, 24,208.

TOLSTOI (tŏl'stoi), or Tolstoy, Lyof Nikolaivitch, Count, novelist and social reformer, born in Yasnaia, Poliana, Russia, Aug.

28, 1828. His family descended from Count Peter Tolstoi, an associate of Peter the Great. After studying at the University of Kazan, he entered the Russian army in 1851 as an officer of engineers, serving throughout the Crimean War, and subsequently published "Sebasto-



COUNT TOLSTOI.

pol." He resigned from the army in 1856 to engage in literature, publishing his first noted novel in 1860. This work is entitled "War and Peace" and is one of the finest productions published in relation to the invasion of Russia by Napoleon in 1812. He published "Anna Karéniná," a highly popular novel, in 1876, and from that time devoted himself largely to a study of modern social life and religious and moral philosophy. His religious life was that of a Christian socialist, placing himself on a plane with the common people and sharing with them his life and in-

come. In the famine of 1891 and 1892 he made large donations to relieve the suffering and was appointed agent for those contributing aid from

foreign countries.

The writings of Tolstoi embrace a number of works on government, social development, religion, and political economy. Among the most important are "The Kreutzer Sonata," "The Kingdom of God Is Within You," "My Religion," "Patriotism and Christianity," "My Confession," "Two Pilgrims," "What to Do," and "The Resurrection." The last mentioned work was published in 1899 and is a treatise on the period of Russian history included between the ascension of Alexander III. and the year 1899. At the time of the Russo-Japanese War he issued several books and tracts that were unfavorable to the government, in which he advocated greater consideration for the interests of the peasants and the middle classes. Tolstoi exercised remarkable influence as a writer on social and political questions both in Russia and other countries. He wrote equally well in the Russian and German. Many of his works have been translated into European and Asiatic languages. In 1900 an edition of his works in twelve volumes was published by Nathan Haskell Dole. He died Nov. 20, 1910.

TOLTEC (tol'tek), or Tolteca, the name of a native race in Mexico, which occupied a large part of that country before the arrival of the Aztecs. They had their capital at Tula, north of the valley of Mexico, where the Spaniards found extensive ruins at the time of the Spanish conquest. It is evident that these people were well advanced in agriculture and many of the mechanic arts. They were workers of clays and metals and invented a system of time which was later adopted by the Aztecs. They were the founders of the civilization which prevailed in ancient Mexico. It appears that they migrated from the north in the 7th century A.D. and expelled a savage race from Anahuac and that they themselves were driven out of the country by the Aztecs when that conquering tribe came from the north.

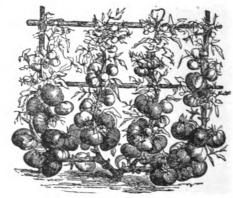
TOLTEC GORGE, a scenic cañon of the Rocky Mountains, in Colorado, on the Denver and Rio Grande Railroad. The railway line passes through a tunnel in the mountain forming the walls of the gorge, and as the train passes near the brink of the mountain side, fully 1,250 feet above the bottom of the cañon, a fine opportunity is afforded to observe the grand aspect of the walls of the gorge and the foaming water that dashes in torrents below. Few places in the Rocky Mountains present more beautiful and remarkable natural scenery. To the grandeur of the natural aspect are added the remarkable extent of trestle work and masterful ingenuity in constructing the railway through the rocks and along the edge of the precipice.

TOLUCA (tō-loo'ka), a city of Mexico, capital of the state of Mexico, 35 miles southwest

of the City of Mexico. It is situated on a lofty plateau, on the line of the Mexican National Railway, and has a cool and healthful climate. The streets are clean and well improved. It has manufactures of flour, cotton and woolen goods, clothing, and earthenware. Toluca is thought to have been founded by the Toltecs and it was occupied by the Aztecs at the time of the conquest. Population, 1910, 31,247.

TOMAHAWK (tŏm'a-hak), the name of a war club used by the Indians in North America, later extended to include the war hatchet. The Indians made these hatchets of stone, usually granite. They cut a depression or furrow on opposite sides, so as to permit fastening a wooden handle by means of sinews or cords of skin. Later, hatchets of steel, furnished by European traders, took the place of the primitive kind. Much skill was developed in the use of the tomahawk, which was either used in a hand-to-hand combat or thrown with great force, when it was directed so the edge would strike first. To bury the hatchet signifies peace, while to dig up the hatchet is equivalent to a declaration of war.

TOMATO (tô-mā'tô), a plant of the nightshade family, which is extensively cultivated for its edible fruit. The tomato is native to



CULTIVATED TOMATO.

South America, whence it was introduced to the United States about 1830. It is a weak-stemmed trailing annual with jagged leaves, resembling the potato in its general appearance, and bears small flowers of a yellowish color. Many species have been evolved by propagation, bearing fruit ranging in size from a small plum to that of a large apple. The fruit is shaped more or less irregularly and is mostly of a red or yellow color. The seed is sown early in March and the young plants are transplanted to the garden as soon as all danger of frost is past, though this mode of treatment applies only in the Temperate zones. It is best to fasten the plants to a wall or other support where the sun may strike them with full effect, thus keeping the vines off the ground and hastening the ripening of the fruit. Tomatoes do not ripen much farther

north than 45°. The fruit is used for a condiment before fully ripened, and the ripened product is eaten raw. However, its greatest value is in preparing sauces, preserves, and pies. Large quantities of tomatoes are canned and sold in the market at all seasons of the year. Maryland, New Jersey, Indiana, and California take the lead in the cultivation of this plant.

TOMB, a structure for the burial of the dead, usually of stone, either within the ground or upon the surface. In ancient times it was customary to construct tombs of great strength, and the dead were embalmed with the view of preserving the bodies until they would take on immortality. In many countries, as in Egypt, the highest efforts of art were bestowed upon the burial places. Remains of these are very extensive, some in a high state of preservation, and innumerable mummies are preserved that date back to the early kings of Egypt. The catacombs of Rome are among the remarkable tombs of antiquity, and similiar burial places are preserved in various parts of Greece. Such burial places are numerous in Asia, especially in regions that were occupied by the ancient Greeks. The most famous is the mausoleum of King Mausolus of Caria, whence the name mausoleum originated, and this tomb is counted one of the seven wonders of the ancient world.

During the Middle Ages it became customary to construct tombs, or sarcophagi, in the churches. Originally they were set on the floor of the church, but later tombs were constructed under the floor and stones with inscriptions were placed so as to make a part of the floor. This style continued in vogue until modern times, and many examples of it may be seen in America, as in the Saint Paul's Church of New York City and other ecclesiastical edifices dating from the pre-Revolutionary period. modern form of tombs is that used in constructing vaults entirely within the ground, in the form of a cistern, suitable for depositing a large number of corpses, as the burial place of Benjamin Franklin in Philadelphia. The largest number of tombs found in America at present is at New Orleans, where the ground is too damp for interment below the surface. These tombs are constructed of solid stone, above the surface of the ground, chiefly of granite. They resemble in appearance small buildings and are constructed on a regular plan so as to permit reaching them by walks and drives. The tombs of New Orleans number several thousand and many of them are very beautiful.

TOMBIGBEE (tom-big'be), a river of the United States, which rises in the northeastern part of Mississippi, enters Alabama a short distance below Columbus, and joins the Alabama River 45 miles above Mobile to form the Mobile River. The general course is toward the southeast, and the total length is 452 miles. It is navigable to Columbus, Miss., a distance of 410 miles from Mobile Bay. The Black Warrior

River is its chief tributary, which joins it at Demopolis, Ala.

TOMPKINS (tomp'kinz), Daniel D., statesman, born at Scardale, N. Y., June 21, 1774; died June 11, 1825. He studied at Columbia College, was admitted to the bar, and in 1804 became a member of Congress. Soon after he was appointed judge of the New York supreme court and was elected Governor of the State in 1807. He supported the policies of Thomas Jefferson and opposed chartering the Bank of America in New York City. During the War of 1812 he rendered valued services to the Americans and in 1817, as Governor of New York, he recommended the abolition of slavery in that He was elected Vice President with Monroe in 1816, was reëlected in 1820, and subsequently served as chancellor of the University of New York.

TOMSK (tômsk), a city of Siberia, on the Tom River, a tributary of the Obi, about midway between the boundary of Europe and Lake Baikal. It is reached by the Trans-Siberian Railway, with which it is connected by a short branch line. The manufactures include soap, spirituous liquors, leather, hardware, lumber products, clothing, and implements. It has a very extensive trade with the Mongols and Kalmucks in the region lying south of Siberia, and contains a number of excellent government buildings, numerous churches, and an imperial university. The government of Tomsk, of which it is the capital, is one of the richest in Siberia. It has extensive mines of gold, silver, copper, zinc, lead, iron, and coal. It produces large quantities of wheat and other cereals and has extensive interests in rearing cattle, horses, and sheep. Tomsk was founded in 1610, but its greater prosperity dates from the construction of the railroad line connecting it with European trade centers. Population, 1916, 65,534.

TOM-TOM (tom'tom), or Tam-Tam, a musical instrument used by many Asiatics, chiefly in China and India. It is in the form of a metal disk, is concave in the central part, and is suspended from the neck by a loop. The player strikes the instrument with the fingers or a set of sticks that have a soft knob. The tom-tom is used to produce tones for dancers and in

some cases to attract attention.

TON, a measure of weight used in Great Britain and the United States. It is equivalent to 20 standard hundredweights of 112 pounds each, or 2,240 pounds. This is the long ton, while the short ton contains 2,000 pounds. The hundredweight in the latter contains 100 pounds. Unless otherwise specified, it is understood that a ton consists of 2,240 pounds avoirdupois. The liquid ton, or tun, contains 252 gallons.

TONAWANDA (tŏn-à-wŏn'dà), a city of New York, in Erie County, on the Niagara River and the Erie Canal, ten miles north of Buffalo. It is on the Wabash, the New York Central, the Erie, and other railroads. Among

2894

the features are the public library, the high school, the armory, the public park, and electric railway connections with Buffalo and Niagara Falls. The chief manufactures are flour, ironware, lumber products, and machinery. Tonawanda is now practically united with North Tonawanda, which is situated in Niagara County. The census of 1900 accords the former a population of 7,421 and the latter, 9,069; total, 16,490. Tonawanda in 1910 had a population of 8,290.

TONE, in music, the sound produced by a sonorous body, as a string or a piece of metal. The term is specially applied to the larger intervals of the diatonic scale, while the smaller intervals are known as *semitones*. Tones are classified according to the qualities and relations of the sound, depending upon their place on the scale, as high or low tones, or as fine, clear, or feeble tones. Some writers use the words *step* and *halfstep* instead of whole tone and semitone.

TONGA ISLANDS (tō'ngà). See Friendly Islands.

TONGKING, or Tonquin, a French protectorate in the southeastern part of Indo-China. It is bounded on the north by China, east by China and the Gulf of Tongking, south by Annam and Siam, and west by Laos. The area is about 46,500 square miles. It is traversed by the Red, or Song-Koi River, which has an extensive delta as it enters the Gulf of Tongking. The eastern part is level and alluvial and the northern section is a plateau and is heavily timbered. Coal, copper, gold, and iron are mined. Among the chief crops are corn, opium, coffee, tobacco, rice, and sugar cane. Large interests are vested in growing live stock, especially cattle and buffaloes. A number of railways are in operation and the harbors are well improved for shipping. Hanoi and Haiphong are the chief commercial and manufacturing centers. Tongking remained an independent state until 1802, when it was annexed to Annam. In 1885 it was made a possession of France, to which country it belongs at present. The inhabitants are mostly Annamese and reside principally in the valley of the Red River. Population, 1916, 7,125,000.

TONGUE (tung), an organ situated in the mouth of nearly all vertebrates, though most completely developed in mammals. In man the tongue is a highly muscular organ, covered with mucous membrane, and the sides, upper surface, and front part are free to move under nerve stimuli. Hence, it is highly useful in mastication, deglutition, and the articulation of speech. The mucous membrane is covered by peculiarly developed papillae, or eminences, which constitute the chief seat of the sense of taste. It has three kinds of papillae-the filiform, the fungiform, and the circumvallate. The conical filiform papillae are minute structures on the upper surface; the fungiform papillae are somewhat larger than the filiform and are scattered irregularly; and the circumvallate papillae

are near the posterior part, forming eight to ten of the largest structures of this kind, and are somewhat V-shaped. A slight furrow, called the raphe, characterizes the tongue along the middle, extending nearly its whole length, and often terminates by a depression behind called the foramen caecum, into which mucous glands open.

A restraining band or fold, called the frenum, abridges the backward movement of the tonguetip. A person in whom it extends quite to the tip is prevented more or less from the free use of the tongue in chewing and articulating speech. This occurs most frequently in children, who are then said to be tongue-tied. The tongue in the lower mammals is essentially the same as that in man. As a rule birds have a small, cartilaginous tongue, which serves in most species rather for prehension than taste, though some birds have a soft and fleshy tongue, as in the parrots, thus giving them ability to imitate the human voice. The horny tongue found in some birds is a prolongation of the hyoid bone. Most lizards have a long, protrusile tongue, usually forked, though in some species it is fleshy and not protrusile. In fishes the tongue is rather an organ of prehension than of taste, and in some species is covered with toothlike projections. The name tongue is applied loosely to very different structures in invertebrate animals. See

TONIC (ton'ik), a medicine used for increasing permanently the strength of organic action. It is intended to induce greater energy in all parts of the body, without necessarily causing any apparent or unusual increase in the healthy action of particular organs. Tonics are usually divided into two classes, those that influence the stomach so as to increase its digestive functions and those that pass directly into the blood and act as stimuli. Among the former are the bitters, such as gentian, boneset, quassia, and chamomile. Various preparations of salts and iron have a favorable influence upon digestion and exert an influence upon the blood. Bathing, friction, and open air exercises are tonics, although they are nonmedical in charac-

TONKA BEAN (ton'ka ben), or Tonqua Bean, a tree native to Guiana. It has pinnated leaves and purplish flowers. It bears a fibrous drupe containing a single seed. The seed has a strong, agreeable odor, and is used in the adulteration of vanilla, for perfuming snuff, and for flavoring smoking tobacco. A number of drupes are put into chests to communicate a pleasant odor to clothes and preserve them from insects. The wood of the tonka bean is hard, heavy, and close-grained and is valued in making cabinetwork. The eboe tree belongs to the same class of plants. Although the fruit has no odor, the wood is valuable, being hard and durable.

TONNAGE (tŭn'nāj), the unit on which the assessment of dues and charges on shipping is based. The carrying capacity, or weight expressed in tons, is termed the tonnage of a ship. For each 100 cubic feet of internal measurement, it is reckoned that a vessel may carry a ton. This unit is sometimes used in buying and selling vessels. Gross tonnage is the entire space within the ship, while net tonnage is the actual space that may be used in carrying cargo or passengers. The term displacement tonnage signifies the weight of the contents and of the ship; when immersed to a fixed point, and dead-weight tonnage is the actual capacity that the vessel can safely carry.

TONSILS (ton'silz), the name of two ovoid bodies situated in the throat, one on each side, between the pillars of the fauces. They are almond-shaped, with the larger end directed upward, but vary in size in different individuals. The tonsils are classed with the ductless glands, but possess minute mucus follicles that give out a secretion which aids in the passage of the food. They are sometimes affected by an acute or chronic inflammation known as tonsilitis, which may be due to the presence of an infectious microörganism that may gain access through the mouth or nasal passages. causes are specific diseases, as scarlatina and smallpox. Severe attacks of tonsilitis may completely block the throat, or develop into quinsy. The tonsils are sometimes enlarged by a cold or sore throat. They may be removed without danger, and such an operation is sometimes necessary when they have become enlarged or suppuration has set in.

TONSURE (ton'shur), the practice of shaving a portion of the hair from the head of a priest, as a mark of distinction between the clergy and the laity. It was not in vogue prior to the 5th century, but at that time the monks began to clip the hair in small places or to shave the entire head. This was done partly to show their contempt of the world. In the 6th century the clergy began to practice tonsuring. In 721 it was made obligatory on all priests by Pope Gregory II. to use the so-called tonsure of Peter, which consists of shaving the entire head and leaving a circular crown of hair. The practice of shaving the front part of the head from ear to ear, known as the tonsure of James. was practiced in Ireland for many years. Priests, bishops, and cardinals of the Roman and Greek Catholic churches still practice this religious observance more or less extensively.

TONTY (tön'tè), Henry, explorer, born at Gaeta, Italy, about 1650; died in 1704. He entered the military service of France at an early age and accompanied La Salle to Quebec in 1678. Soon after he built a vessel and explored the eastern shore of Lake Michigan, the Illinois River, and Green Bay. In 1680 he built a fort near Peoria, Ill., and twice descended the Mississippi. He resided among the Illinois Indians until 1702, when he joined Iberville in Louisiana. His death occurred at Fort Saint Louis, now Mobile.

TOOMBS (toomz), Robert, statesman, born in Wilkes County, Georgia, July 2, 1810; died in Washington, Ga., Dec. 15, 1885. After graduating from Union College, New York, in 1828, he studied law at the University of Georgia and entered upon a successful law practice. He served against the Creek Indians, was elected to the State Legislature in 1837, and served in the House of Representatives as a Whig from 1845 to 1853. While in Congress he favored the compromise measures of 1850. From 1853 to 1861 he was a member of the United States Senate, favoring a disunion of the nation, and was formally expelled from the Senate in March, 1861. He served as a member of the Confederate Congress and was a prominent candidate for the Presidency of the Confederate States. Subsequently he became Secretary of State, but resigned to accept the appointment of brigadier general in the Confederate army, serving with distinction in several important engagements. He made an extended tour of Europe shortly after the war, and, on returning to America, refused to take the oath of allegiance to the United States government. However, he served as a member of the State constitutional convention. Toombs was noted as an able speaker and writer.

TOP, a toy used extensively by children. It is constructed in the form of a pear, either of wood or metal, and is made to spin on its point by drawing off a string wound round its stem or surface. A well-made top will spin on a smooth surface for some time and the motion may be continued by the use of a whip. Metal tops are hollow and have openings at the side, causing them to whistle when whirling at a high speed. The blending of colors can be illustrated by whirling a top whose upper part is painted differently, which, when in motion, shows the effect of mixing different colored pigments.

TOPAZ (tō'păz), a mineral which has a high rank among the gems. It has a vitreous luster and is either transparent or translucent. The color ranges usually from white to yellow, but there are sometimes light shades of green, blue or red. Pure topaz has a specific gravity of 3.498, and its hardness is greater than that of quartz. It is composed of silicate of aluminum, with a little oxide of iron, and a quantity of fluoric acid. Topaz is found in many parts of the world, generally in primitive rocks. Fine specimens are obtained in Brazil, Ceylon, Siberia, Scotland, Germany, and at Cornwall, England. Brazilian topaz is regarded the most valuable and, when cut in facets, it closely approaches the brilliancy and luster of the diamond. False topaz is a variety of yellow

TOPEKA (tō-pē'kà), the capital of Kansas, county seat of Shawnee County, 65 miles west of Kansas City, on the Kansas River. It is on the Union Pacific, the Missouri Pacific, the Chi-

cago, Rock Island and Pacific, and the Atchison, Topeka and Santa Fé railroads. The site is a rolling tract of land, elevated about 800 feet, and the river is crossed by a number of bridges. Many of the streets are paved substantially with brick and asphalt and avenues of trees make the residential part attractive. An extensive system of electric railways provides communication with all parts of the city and many points within the State. The streets are well lighted with gas and electricity and systems of waterworks and sewerage are maintained.

The State capitol, located in the heart of the city, is the most notable building. Other public edifices include the county courthouse, the public library, the post office, the city hall, and the auditorium. It is the seat of the Washburn College, the Kansas Medical College, the College of the Sisters of Bethany, the State insane asylum, the Santa Fé Railway Hospital, the State reform school, and a number of other institutions. The public library has about 30,000 volumes of well-selected books. The public schools are well graded and organized and the system culminates in a high school with advanced courses.

Topeka is surrounded by a fertile farming country, hence is important as a market for grain, live stock, and fruits. It has the extensive shops of the Santa Fé Railroad, flouring mills, steel and iron works, and numerous wholesale and jobbing houses. The general manufactures include machinery, clothing, earthenware, cured and packed meat, starch, and cigars. Topeka was platted in 1854 and became the center of antislavery men in the contest following the passage of the Kansas-Nebraska Bill. The so-called Topeka Constitution was adopted by an antislavery convention in 1856. It was chartered as a city the following year and in 1861 became the capital of the State.

Population, 1905, 37,641; in 1910, 43,684.
TOPLADY, Augustus Montague, hymn writer, born in Farnham, England, Nov. 4, 1740; died Aug. 11, 1778. After studying at Westminster School, he pursued a course at After studying at Dublin, Trinity College, and soon after began successful ministerial work. He held important charges in Devonshire and London, and became noted as a writer of books on religious subjects and of numerous church hymns. As a composer of hymns he has been surpassed by few writers, many of his songs being still in extensive use. The most noted written by him is "Rock of Ages, Cleft for Me," which is esteemed by some the finest in the English language. He edited the Gospel Magazine for several years.

TORNADO (tôr-nā'dô). See Storms. TORONTO (tô-rŏn'tô), the second city in Canada, capital of the Province of Ontario, 330

Canada, capital of the Province of Ontario, 330 miles southwest of Montreal. It occupies a fine site on the northwestern shore of Lake On-

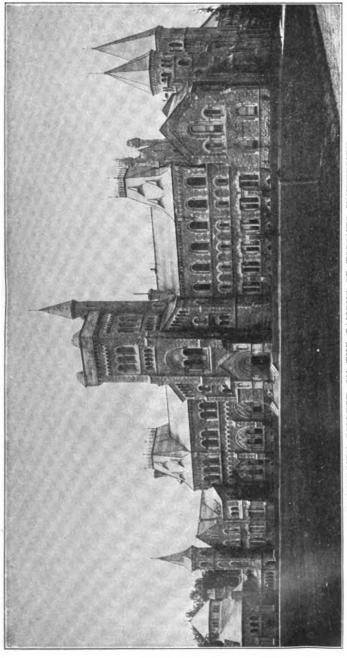
tario, on an inlet called the Bay of Toronto, near the Don River. An area of about 17.7 square miles is included in the city. The water frontage is about eight miles and the city extends inland over three miles. The harbor is one mile wide and five miles long. It is protected by a crescent formed island that serves as a natural breakwater. Ships of the largest capacity are accommodated in the harbor, from



which steamers sail to the leading ports on the Great Lakes. Railroad transportation is facilitated by the main lines and numerous branches of the Grand Trunk and the Canadian Pacific railways. An extensive system of electric street railways has lines to all parts of the city, with which are connected interurban railways that reach many towns and places of interest.

DESCRIPTION. The streets of Toronto are broad and regularly platted, crossing each other at right angles. Fine avenues of trees shade the residential sections, in which the lawns and parkings are well maintained. Queen's, or University, Park, near the western part, is a beautiful section of the city. It occupies a rolling tract sufficiently elevated above the lake to afford an outlook over the harbor, and within it is the monument erected to the memory of those who fell at Ridgeway in 1866. Other public grounds include Riverdale Park, Island Park, and the exhibition grounds. The last named tract is the seat of the annual fairs of the Industrial Association. All parts of the city are well drained. The public utilities include gas and electric lighting, waterworks, and sewerage. The pavements are constructed largely of stone, asphalt, and macadam.

BUILDINGS. The Parliament buildings, situated in Queen's Park, are of brown stone in the Romanesque style. Other buildings of note include the customhouse, the Governor's residence, the post office, the city hall, the Foresters' Temple, the Traders' Bank building, the county courthouse, the public library, and the King Edward and Queen's hotels. Among the institutions are the Victoria University, the Trinity College, the University of Toronto, the Knox College, the Upper Canada College, the Wycliffe College, the Saint Michael's College, the College of Technolegy, and the Government School of Practical



The University of Toronto, which includes a number of affiliated schools, is one of the greater educational institutions of Canada. To the west of Queen's Park, in Toronto, is the campus of the University, among whose buildings the most striking in appearance is that of University College, built in the Norman style of architecture with massive proportions whose effect is heightened by the presence of a huge central tower. The view from the tower exbraces the whole city and its environs. UNIVERSITY COLLEGE, ON THE CAMPUS OF TORONTO UNIVERSITY

(Art. Toronto)

4			
14			
	9		

Sciences. It has numerous hospitals, asylums, and scientific and educational associations. The leading ecclesiastical buildings include the Saint James's Cathedral, the Saint Michael's Cathedral, the Jarvis Street Baptist Church, the Metropolitan Methodist Church, the Bon Street Congregational Church, the Church of the Ascension, and the Saint James's and Saint Andrew's Presbyterian Church. The public library has over 100,000 volumes and branches are maintained for the accommodation of different parts of the city. Toronto Island, or Hanlon's Point, as it is generally called, is famous as a pleasure resort and is known as the Coney of Canada.

INDUSTRIES. Toronto is important as a jobbing and wholesaling center. It has a large lake and railway trade in supplying markets in different parts of the Dominion. The manufacturing enterprises include shipyards, flour and grist mills, steel and iron foundries, railway shops, lumber yards, and brick yards. Among

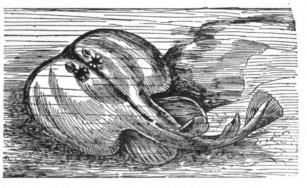
the general manufactures are clothing, boots and shoes, furniture, carpets, pianos, hardware, cigars and tobacco, bicycles, and spirituous liquors. Electric power is supplied from Niagara Falls.

HISTORY. Toronto was founded in 1794, when it was called York, and until 1841 served as the capital of Upper Canada. It became the capital of Ontario in 1867. The American army captured the city in 1813. Its greater prosperity dates from 1834, when the name was changed to Toronto and a charter of incorporation was granted it by the provincial legislature. Montreal is the only Canadian city that is larger than Toronto. Population, 1901, 208,040; in 1911, 376,240.

TORONTO, University of, an educational institution at Toronto, Ontario, founded as King's College in 1827. It was formally opened for instruction in 1841 and the departments of law, medicine, arts, and divinity were established the following year. It received its present name in 1849 and since has undergone reorganizations that have contributed to make it one of the leading educational centers in America. In 1853 the functions of the institution were divided into the corporations of the University of Toronto and the University College (q. v.). The former has faculties in law, arts, medicine, applied sciences, and engineering. Courses are maintained in music, dentistry, agriculture, pharmacy, pedagogy, and domestic economy. With it are affiliated a number of professional institutions, and several colleges and universities are federated as a part of the university system. Both men and women are admitted. It has a library of 80,000 volumes and property valued at \$3,750,000. The enrollment averages about 3,750 students.

TORPEDO (tôr-pē'dō), a class of fishes allied to the rays and skates, having an elec-

trical apparatus with which they stun or kill their prey and defend themselves against enemies. Six species are common in the Atlantic and Indian oceans. Three of these are native to the Mediterranean, but there are many allied species often spoken of as belonging to the same class. They vary in size. The larger specimens are about four feet long and two feet wide at the head, and weigh 50 to 75 pounds. On each side of the head is a mass composed of plates and prisms, each forming a kidney-shaped enlargement, and within them are the electrical These organs, frequently including many thousand plates and prisms, convert nervous energy into electricity. To complete the circuit the animal or object aimed at must come in contact with two distinct points, either directly or through the medium of some conductor. Full-grown torpedoes are able to inflict a severe shock, the larger and healthy specimens being able to stun a man. The American



TORPEDO.

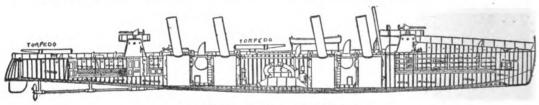
species are dark brown above and white beneath. The larger specimens have a length of nearly five feet. They have from 250,000 to 300,000 plates in each battery.

TORPEDO, a powerful military device, containing an explosive commonly designed to be fired by concussion. Two distinct forms of the torpedo are in general use. These are in the form of a cigar-shaped boat, which is projected and carries a powerful charge under water against a hostile vessel, and a submarine mine placed stationary in the water and intended for the destruction of vessels of an enemy. Torpedoes of a stationary nature are usually called submarine mines and others used for offensive operation are known as locomotive torpedoes. Three general classes of submarine mines are constructed. They include those fired from the shore by means of an electric current, when the enemy is observed within the area of the mine; those connected with the shore by an electric wire and fired when struck by a ship of the enemy; and those fired by some contrivance within themselves when struck by a vessel. Mines are placed in position in channels or near coasts to supply protection against the approach of vessels. They consist of a strong metallic case heavily charged with gun cotton or some equally effective explosive. Efforts to use torpedoes in naval warfare were first made in the latter part of the 17th century, but no material progress resulted until the middle of the 18th century. However, the first successful application of them was made in the Civil War of the United States, within the period from 1861 to 1865.

Many ingenious and improved forms of the locomotive torpedo are now in successful use. The Sims-Edison is a typical form. It carries its own motor, but is controlled and receives its motive power from the shore through a controlling cable. The torpedo is mounted by a long boat-shaped float, usually fourteen to eighteen feet long and fourteen to eighteen inches in diameter, and is prevented from sinking by buoyant ballasts. In the front end is the dynamite or gun cotton, which explodes when coming in contact with a vessel. An electric motor in the center supplies the power to drive the screw propeller at the stern, thus caus-

TORPEDO BOAT, the name of a vessel used in modern warfare, fitted to use the torpedo as a weapon with which to attack the enemy. Vessels of this class are of high speed and are fitted with apparatus to launch torpedoes with facility. In construction they are long, slender, and low in the water. They carry one or two torpedoes, which are on the deck and in such a position that they can be turned readily in any direction. Larger vessels carry the torpedoes near the side, while the smaller ones have them on the fore-and-aft midship line. At the time of battle the torpedo boat is employed to approach the ships of the enemy secretly, usually under cover of night or in a storm, and the torpedoes are thrown against the vessels. A brilliant search light is used to locate the opposing vessels, and as soon as the torpedoes are discharged the torpedo boat hastens to escape.

Four distinct classes of these vessels are in use, though they differ widely in construction. These include seagoing boats, harbor boats, torpedo boat destroyers, and portable boats, the last mentioned being carried by men of war. A



VERTICAL SECTION OF A TORPEDO BOAT.

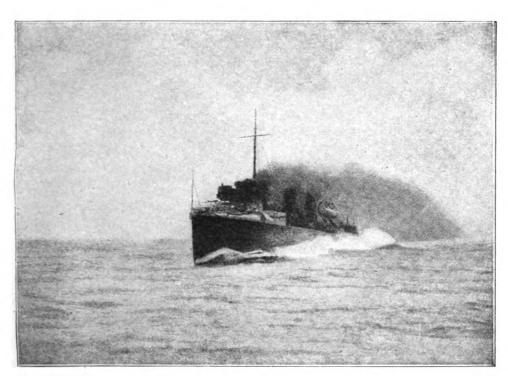
ing it to move forward in the direction desired by the person operating the controlling cable on the shore, and it is set off either by concussion or by an electric fuse. The Howell torpedo is discharged by powder from a firing tube, instead of being carried by a motor. The Patrick torpedo is propelled by carbonic acid and is one of the heaviest, weighing about 7,250 pounds. It is eighteen inches in diameter and forty feet in length. The Hall torpedo has a flask eight feet in length filled with compressed air, by which it is propelled instead of by electricity. Other modern implements of this kind include the Harvey, the Whitehead, and the Brennan torpedoes.

Most torpedoes have a balance rudder to regulate their depth below the surface, thus enabling them to be propelled in the water at any depth desired, and consequently may be fired at any distance above or below the armor of ironclad vessels. The implements of war are carried on torpedo boats (q. v.), which are especially fitted to launch torpedoes when the ships of the enemy are some distance from the land. As a protection against torpedoes, ships sometimes suspend nets made of steel rings from spars, but they have not proved effective in active service.

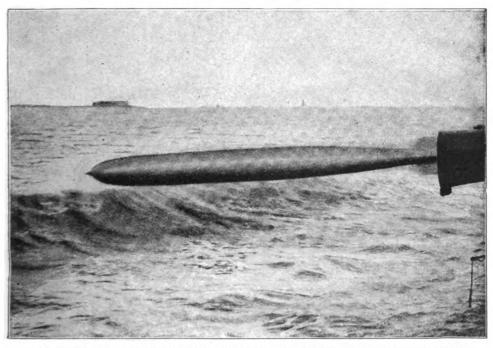
torpedo boat destroyer is a torpedo boat of large size and high speed and is employed to combat against the approach of the enemy's torpedo boats as well as to destroy them. The newer style of vessels of this class is submarine, that is, it is capable of sailing under water. Two classes of submarine torpedo boats are in use, the submerged and the submergible. The former moves in the water with a small part of the hull exposed, while the latter, as the name indicates, is so constructed that it may be entirely submerged.

The best test of the torpedo boat in modern warfare was made during the Great European War. It proved that the most serviceable torpedo boat destroyers have a length of 220 feet, a beam of over twenty feet, and a draft between nine and ten feet, giving a displacement of between 300 and 400 tons. These vessels were used successfully for scouting work, in fact they took the place of ordinary cruisers with 5,000 tons displacement. Torpedoes were thrown so successfully against the most powerful ships, including both cruisers and dreadnaughts, that many large vessels were sunk or driven off the sea.

TORQUEMADA (tôr-kā-mā'thà), Thomas de, inquisitor general, born in Torquemada, Spain, in 1420; died at Ávila, Sept. 16, 1498.



(Art. Torpedo)
THE BRITISH TORPEDO BOAT ALBATROSS, SHOWING THE VESSEL IN MOTION AT
THE RATE OF FORTY MILES AN HOUR.



SNAP SHOT OF A WHITEHEAD TORPEDO AS IT IS FIRED WHILE THE TORPEDOBOAT DESTROYER IS MOVING AT FULL SPEED.

	+		

He first served as prior to the Dominican monastery at Segovia, and in 1483 was made inquisitor general for Spain by Ferdinand and Isabella. This appointment was sanctioned by Pope Alexander VI., though the latter subsequently appointed a commission to limit his power in bringing people to the Inquisition. Torquemada established several tribunals, obtained the expulsion of the Moors and Jews from Spain, and promulgated a code of civil laws. He was instrumental in giving the Inquisition thorough organization in Spain.

TORRES STRAIT (tŏr'rĕz), a channel separating New Guinea from Australia. It was so named from Torres, who discovered it in 1606. It is eighty miles wide and is difficult to navigate on account of numerous reefs and shoals. Cape York, the northernmost point of Australia,

projects into it.

TORREY (tŏr'rĭ), John, botanist, born in New York City, Aug. 15, 1796; died March 10, 1873. He studied in New York and Boston, entered a medical school in the former city, and in 1818 began the practice of medicine. Subsequently he became interested in botany, and in 1824 published an extensive work on the plants of the Northern States. He was made professor of chemistry and geology at the West Point Military Academy in the same year, and in 1827 became professor in the New York College of Physicians. A few years later he made collections of plants in Colorado and in 1836 became botanist of the State of New York. Torrey possessed a fine botanical library, which he presented to Columbia College, New York. His writings include "Flora of the State of New York," "Catalogue of Plants Growing Within Thirty Miles of New York," "Flora of the Northern and Middle States," and "Flora of North America." In publishing the last mentioned work he was assisted by his pupil, Asa Gray, who wrote a sketch of his life. Torrey contributed many articles to the American Journal of Science.

TORRICELLI (tŏr-rê-chěl'lê), Evangelista, mathematician and physicist, born at Faenza, Italy, Oct. 15, 1608; died Oct. 25, 1647. Being left fatherless at an early age, he was trained under the direction of the Jesuits, and in 1627 began the study of science under Benedetto Castelli at Rome. He went to Florence in 1641, where he was associated with Galileo for several months, and subsequently became professor of mathematics in the Florence Academy. His name is associated with the history of science mainly because he discovered the law on which the barometer depends. He wrote several treatises on mathematics and geometry, the most important being "Opera Geometrica."

the most important being "Opera Geometrica."

TORRINGTON (tor'ring-tun), a borough of Connecticut, in Litchfield County, on the Naugatuck River, 27 miles northwest of Hartford. It is on the New York, New Haven and Hartford Railroad and has communication by

electric railways. The features include the public library, the municipal building, the high school, the public park, and the Y. M. C. A. building. Among the manufactures are hardware, woolen goods, clothing, bicycles, needles, plaited goods, nails, and machinery. The place was first incorporated in 1740 and became a borough in 1887. It is the birthplace of John Brown, the abolitionist. Population, 1910, 15,483.

TORSION BALANCE (tor'shun bal'ans), an apparatus used to measure delicate attractions and repulsions. The essential part consists of a metal wire, or a silk thread, to which a needle is attached, and the apparatus is suspended from a fixed point. The attraction or repulsion is measured by the resistance offered to it by the torsion of the wire, that is, by its

being twisted.

TORT, in law, a civil wrong or injury, in contradistinction from a crime against the public or state. Tort may be committed where a contract or other agreements exist, but it is not necessary that a claim for damages be based upon a contract, since torts are injuries or infringements of the civil rights that belong to individuals. However, an offense may be both a tort and a crime, as in the case of maintaining a nuisance or committing the offense of assault and battery. In either of these cases the injured party may recover damages and the offender may be punished under the criminal law.

TORTOISE (tôr'tis), a class of reptiles which belong to the same order as the turtles, but differing from them mainly in that they frequent the land, marshes, and inland waters, while the turtles live principally in the sea. The skeleton of both classes is mostly a horny inclosure of the body, which forms an outside bony case to protect the fleshy part and the true skeleton, and is covered by a skin or by horny epidermic plates. The upper part of the shell is called the carapace and is formed of bony plates fitting into or overlapping each other, while the lower part, or plastron, takes the place of the breastbone in other animals. In most species the latter consists of one piece. Inside the body proper is the true skeleton, the bones of which serve as levers for the animal to propel itself. When walking or swimming, the head, legs, and tail are protruded from the shell, but in a state of rest or during a time of danger they are carefully drawn into the shell for protection. Some species have plates that may be closed down to protect the fleshy parts and the head when drawn into the shell. All are oviparous and lay 75 to 125 eggs at a time. The eggs are deposited in a sandy place near a marsh or body of water, where they are hatched by the heat of the sun.

The species are very numerous and the sizes range from small forms about the size of a hen's egg to the gigantic land tortoise of the tropics, which attains an age of 100 years and

a weight of 875 pounds. Land tortoises are slow and awkward in their movements, but those living in water move with remarkable rapidity, either to seize their prey or to escape danger. The food of a few terrapins, land tortoises, and some marine turtles consists of herbs, but many species are carnivorous, preying on frogs, fishes, and small aquatic animals. The salt-marsh terrapin, or diamond back, is native to the Atlantic coast of North America and is famous for its delicate flesh. It is caught in great numbers in summer and kept in pens for sale in winter, the females with eggs being considered the best. The green turtle is caught in large quantities in the West Indies and on the coast of the Gulf of Mexico. It is considered an important article of food.

Species of tortoise known as the loggerhead turtles are very common along the Atlantic coast of North and South America and Europe. They are also abundant in the Mediterranean. The flesh of the adult is rarely eaten, but that of the young is considered quite nutritious. The hawksbill is native to the warmer parts of Amer-

and filings after molding and shaping them when heated. Tortoise shell is used in the manufacture of toilet articles, such as combs and handkerchief boxes. The Romans used this material in veneering furniture, and products of this kind are still made by the Japanese. Horn and celluloid are used extensively as imitation of tortoise shell.

TORTUGAS. See Dry Tortugas.

TORTURE (tôr'tûr), a form of punishment employed to extract evidence from unwilling witnesses, to compel confession by inflicting pain, or to increase the punishment after judicial conviction. The Greeks used torture as a judicial procedure for the punishment of slaves, which was the case in Rome until in the later period of its history, when it was extended to various cases of a criminal nature. Torture was adopted as a form of punishment under ecclesiastical sanction about the middle of the 13th century, reaching its most hideous form in the practices of the Inquisition. The modes of punishment were very numerous, including the rack, an apparatus to stretch the



GREEN TURTLE.

ica and is not eaten to any considerable extent, but it is caught in large numbers for its shell, the horny plates of which form the tortoise shell sold in the market. It is used for ornamental work. Tortoises are very numerous in all parts of the world, but they are not so large as the turtles. The snapping turtle found from Florida to New Brunswick is one of the largest, some specimens being four feet in length. Other species common to North America include the mud tortoise, gopher tortoise, spotted tortoise, softshelled tortoise, and box tortoise. Animals of this genus found in the Temperate zones hibernate. All reside throughout the year in the same locality, except the marine turtles, which migrate periodically to breeding stations. Many fossil turtles have been described, some of which attained an immense size.

TORTOISE SHELL, the name commonly applied to the scales that cover the shell of the hawksbill, a large turtle found in the tropical seas. These scales are remarkable for their plastic quality and under the influence of heat may be formed into various shapes. It is possible to weld pieces of the shells under pressure when heated. Artisans use the chips

TORTOISE.

body; the boot, containing pegs or wedges of iron; the thumbscrew; the scourge; and confinement in dungeons. Other forms were to pour melted lead in the ears, to cut off the limbs, to put out the eyes, to suspend the body over a slow-burning fire, to crush the body, and to crucify. In the last mentioned form the body was frequently covered with honey that insects might torment the helpless and unfortunate victim. Torture was employed in England until the reign of Charles I., but it continued in use in Scotland until near the beginning of the 18th century. Prussia and Austria abolished it about the middle of the 18th century, France in 1789, and Russia in 1801. A few cases of torture are on record in America, especially the case of Giles Corey of Salem, who, in 1692, refused to plead when arraigned for witchcraft. Cruel and unusual punishments are especially prohibited by the Constitution of the United States and by those of most states.

TORY (tō'rỹ), the name of a leading political party in Great Britain. It was originally applied to the Roman Catholic outlaws who lived in the marshy district of Ireland. About 1679 it came to be used as the name of all,

irrespective of descent, who were opposed to the bill that excluded the Duke of York from succession. Those who favored the succession of the duke used the term to imply that his opponents had sympathies with the Roman Church. The name was finally adopted by the great political party that opposed the Whigs in British politics, but in 1830 this party was displaced by the Conservatives. The British loyalists during the American Revolution were called Tories.

TOTAL ABSTINENCE (to'tal ab'stinens), a term commonly used to imply entire abstention from the use of alcoholic liquors, except under medical prescription. Temperance societies were first organized to limit the use of liquor to reasonable quantities, rather than to teach the duty of totally abstaining from using all forms of intoxicants. Members were pledged to observe moderation, calmness, and self-control, not only for their own good, but for the sake of their fellows. The history of the temperance movement dates from ancient times, and we learn that the Jewish Nazarites acted on total abstinence principles. Mohammedans and the higher Hindu castes nominally abstained from intoxicating liquor, this being a religious obligation placed upon them.

The first temperance society on record is that of Saint Christopher, founded in Germany in 1517, whose members were pledged to exercise moderation. An organization formed at East Hampton, Long Island, in 1651, for the purpose of limiting the sale of intoxicants, was the first to be instituted in America. In 1789 a society of farmers was formed at Litchfield, Conn., the members pledging themselves to abstain from the use of liquor in their farm work. Total abstinence was recommended by H. Humphrey in 1812 and by Lyman Beecher soon after, thus giving rise to various temperance societies. However, the American Temperance Union was not instituted on the basis of total abstinence until in 1836. It was followed by a number of similar associations, and many powerful organizations with associated societies sprang up.

Among the influential temperance societies of America are the Washingtonian Temperance Society, organized in Baltimore in 1840; the Sons of Temperance, instituted in New York City in 1843; and the Independent Order of Good Templars, founded in the State of New York in 1851. The last mentioned adopted a platform in 1859, declaring for total abstinence, no license, and absolute prohibition. It is one of the most powerful organizations in the world, having at present 85 grand lodges, and a membership of 650,000. This number includes the juvenile branch with 181,382 members. The organization is in the form of a civic order, having a ritual, signs, and passwords. The Royal Templars of Temperance, formed in 1877, is a similar organization, but in addition has a form of life insurance and benefits for those who are in need or distress.

A temperance crusade was started at Washington Court House, Ohio, in 1873. It was an organized effort against saloons and resulted in closing many places where liquors were kept for sale. In these campaigns men and women armed with weapons and hymn books either persuaded the keepers to close their places of business or forcibly destroyed their wares. The most powerful society of temperance workers ever organized is the National Woman's Christian Temperance Union. It has auxiliaries in every State and Territory of the United States and is organized locally in more than 10,000 towns in the Union. Affiliated with it are branch organizations in Canada, the Hawaiian Islands, Cuba, Great Britain, Japan, Madagascar. India, South Africa, the Philippines, France, Germany, Russia, and almost every civilized nation. This organization is a union of Christian women for the purpose of educating the young, reforming the drinking classes, stimulating public sentiment, and ultimately securing the abolition of the liquor traffic by legal enactments. The society owns the Woman's Temple, one of the finest buildings in Chicago, which is the headquarters and principal seat of influence.

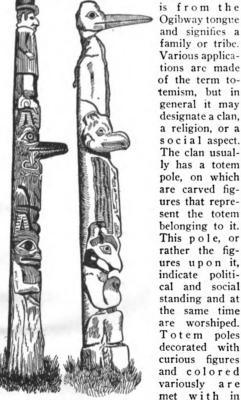
The crusade against intemperance was materially stimulated in the British Isles by Theobald Mathew, who may justly be regarded the apostle of temperance in Ireland. He began work in 1838 and in less than a year secured 1,800,000 recruits to the cause. The Independent Order of Good Templars was founded in England by Joseph Malins in 1868, though similar organizations had operated some years previous. At present many allied organizations are maintained in Great Britain, including the Scottish Temperance League, the National Temperance League, and the Irish Temperance League. Cardinal Manning in 1873 began a vigorous temperance movement among the Roman Catholics. A greater interest is developing in favor of temperance in all countries under Christian influence, both along the line of moderation and total abstinence.

Prohibition of the sale and manufacture of liquor is another form of the temperance movement. Legal enactments were directed against the use of liquor as early as 1639 in the Massachusetts colony, and Connecticut and several other colonies enacted similar laws. Pennsylvania imposed a duty on imported liquors in 1756, and measures to abolish the manufacture have been introduced into the American Con-The first restrictive gress at different times. liquor law was passed in Maine in 1846, and in 1851 a more stringent prohibitory one, known as the Maine Law and drafted by Neal Dow, was enacted in its place. This law has been in effect practically ever since. Prohibition laws were enacted in New York, Vermont, Connecticut, New Hampshire, Kansas, Iowa, Rhode Island, and many other states, but they have been modified or repealed more or less at dif-

ferent times. More recently, from 1907 to 1918. prohibitory laws have been enacted in a majority of the states, in some states local option laws and in others prohibitory or "Bone Dry" laws. The Prohibition party, which placed its first candidate in the field in 1872, did not poll a heavy vote at any time, but it had a marked influence upon public policy. In 1916 the Webb-Kenyon law prohibited the transportation of liquor from a "wet" to a "dry" state. Congress, in 1917, added a prohibitory law to the Postoffice Appropriation Bill, forbidding the sending of liquor advertising by mail. Congress also, in 1917, submitted the Constitutional Prohibition Amendment for ratification by the states, the term for ratification to be six years from the date of submission. Prohibition Party.

TOTEMISM (tō'tem-iz'm), a form of worship found in many savage communities, especially among the Indians of North America

The word totem



TOTEM POLES.

many parts of Alaska and in the northern part of Canada. They vary in length from ten to fifty feet. When planted in the ground, only the portion having the figures is exposed and these are chiefly on one side. Poles of this class are made of the bodies of trees measuring from one to two feet in diameter.

TOUCAN (too'kan), a class of climbing birds which are native to tropical America. They are noted for their immense beak, which is toothed along the margins of the mandibles. The vellow toucan is about eighteen inches long. the tail is short, and the bill is orange-red. The beak is about nine inches long, but is comparatively light owing to its being penetrated by numerous air cells. About fifty species have been described, but all are American birds. The



TOUCAN.

plumage of most toucans is gaudy, commonly diversified by red, blue, black, and yellow. Among familiar species are the toco toucan, the aracari toucan, and the yellow-breasted toucan. These birds never approach houses, but instead live in the shade of the forests, usually in pairs, though at some seasons they congregate in small parties. Their diet consists almost exclusively of fruits, but in the absence of this kind of food they feed on fish, birds, and small quadrupeds. They may be tamed and kept in confinement, but are much more beautiful in the native state. The food, after being swallowed, is brought up to undergo mastication, an operation corresponding to the chewing of the cud among ruminants.

TOUCH (tuch), the sense of feeling, giving man cognizance of solidity, temperature, smoothness, and other palpable properties of bodies. It is frequently called the general sense, since its nerves are spread over the whole body and by it we become conscious of all sensory impressions which are not the objects of the four special senses of taste, sight, smell, or hearing.

The principal end organs of the nerves of touch are in the skin, called the papillae, which are minute conical projections covering the cutis. Each one of these papillae contains the tiny nerve twigs, which receive the impression and transmit it to the brain, where the perception

is produced.

Although there are terminal organs of the sensory nerves all over the body, the sense of touch is more acute in some places than in others, owing to the presence of a greater number of papillae. The points of the fingers are more sensitive than any other part of the body, being able to convey the largest number of different impressions, but the forehead requires less pressure to receive sensations than any other portion. Keenness of touch is likewise found in the tongue and the red parts of the lips. The least acute surfaces are those of the middle arm and thigh and of the middle of the back and the neck. This may be demonstrated by placing two objects in contact with the neck, when the sensation produced is that of one object, though the two points in contact with the skin are a short distance apart. The sense of touch is capable of a wide range of cultivation. Physicians acquire by practice the so-called tactus eruditus, or learned touch, and the blind develop a delicacy of touch that almost compensates the loss of sight. This is due to the sympathy between the different organs, since, when one sense fails, the others develop to remedy the defect.

TOUCHSTONE, or Lydian Stone, a hard variety of jasper, so named from its use in testing the purity of metals, which is done by rubbing them across the surface. The name Lydian stone is applied from Lydia, in Asia Minor, where a peculiar species is found. In making the test, a series of needles, known as touch needles, is used. The metal to be tested is first rubbed across the surface of the stone and then a needle of the same material is drawn across the surface, the purity being judged by the nature of the streak. In testing gold, a needle of pure gold is used and the streak made by it is compared to the streak made by the

metal tested.

TOULON (too'-lon), a seaport city of France, in the department of Var, 35 miles southeast of Marseilles. It occupies a sheltered site on the Mediterranean and ranks next to Brest as a naval stronghold of the republic. The city is defended by strong forts on the adjacent mountains, has well-constructed redoubts and arsenals, and contains a secure har-Among the principal buildings are the townhall, the military and naval schools, and a Romanesque cathedral dating from the 11th century. It has a large interior and foreign trade. The manufactures include cotton and woolen goods, silk textiles, pottery, ships, engines, and farming implements. The streets are wide and straight, crossing each other at right angles.

Gas and electric lighting, rapid transit, waterworks, sewerage, and several fine parks are among the improvements. The Romans utilized the advantageous situation of Toulon in making it a trade port. It was destroyed by the Saracens in 889 and was captured by the allied army of Spain and England in 1793. Subsequently its fortifications were greatly strengthened and its harbor has been improved by the construction

of moles. Population, 1911, 104,582.

TOULOUSE (too-looz'), a city of France, on the Garonne River, 140 miles southeast of Bordeaux. It is entered by a number of important railroad lines, has well-paved streets, and is improved by modern facilities. The city has gas and electric lighting, street railways, waterworks, fine public parks, and several institutions of higher learning. Among the noteworthy buildings are the Cathedral of Saint Etienne, the municipal theater, the palace of justice, the city hall, the central railroad station, the Church of Saint Sernin, the Musée, the university, and several hospitals, asylums, and professional institutions. It has a number of well-patronized associations of science, art, law, and economics. The manufactures embrace cloth, glass, paper, leather, starch, macaroni, pottery, furniture, flour, saddlery, tobacco, machinery, cutlery, wine, and musical instruments. Large quantities of agricultural, dairy, and fruit products are sold in the market. It has a vast trade in raw and manufactured silk. Toulouse was made the capital of the Visigoths in the 5th century. On April 10, 1814, it was the scene of a battle, in which the French under Soult were defeated by the allies under Wellington. Population, 1911, 149,576.

TOURCOING (toor-kwan'), a city in northern France, in the department of Le Nord, seven miles northeast of Lille. It has railroad facilities and is surrounded by a fertile agricultural and fruit-growing region. Among the chief buildings are the city hall, the public library, the Gothic church, and many schools. It is important for its extensive interests in the manufacture of cotton, linen, wool, and silk textiles, this enterprise employing about 50,000 spindles. Other manufactures include carpets, woven goods, soap, sugar, furniture, dyes, and machinery. The streets are regularly platted and well improved, having pavements, rapid transit, sewerage and waterworks. Population, 1916,

81.671.

TOURGÉE (toor-zha'), Albion Winegar, journalist and author, born in Williamsfield, Ohio, May 2, 1838; died May 21, 1905. He studied at the University of Rochester, New York, from 1859 to 1861 and in the latter year enlisted as a New York volunteer in the Union army, serving at Bull Run, Perryville, and other engagements. Subsequent to the war he practiced law in Greensboro, N. C., was a member of the State constitutional conventions of 1868 and 1875, and in the meantime published the Union Register. In 1868 he was chosen judge of the North Carolina superior court and was appointed pension agent in 1876. His first published work, "A Fool's Errand, by One of the Fools," appeared in 1879. It treats of his experience in connection with southern sentiment and had a remarkable sale, fully 140,000 being sold within a comparatively short time. From 1882 to 1884 he published the New York Continent and in 1889 became professor in the Buffalo Law School. His principal works include "Statutory Decisions of the North Carolina Reports," "Hot Ploughshares," "Figs and Thistles," "Bricks Without Straw," "Out of the Sunset Sea," "Pactolus Prime," "The Battle of the Standards," and "An Appeal to Caesar."

TOURMALINE (toor'mà-lin), a crystalline

mineral ranked among the gems, occurring in primitive rocks, usually in gneiss, granite, and mica slate. It includes opaque, transparent, and translucent species. The principal components are silica and alumina, these forming about three-fourths of the whole, the remainder being largely lime, magnesia, fluorine, iron, manganese, potash, and other substances. The prevailing colors are red, green, blue, brown, and black, though colorless specimens are not rare. It crystallizes in prisms that are either three or six-sided and has a vitreous luster. Tourmaline is a double-refracting crystal and has the property of polarizing light. Jewelers prize the fine specimens, though they are comparatively rare. Tourmaline occurs in Siberia, Brazil, Ceylon, New Brunswick, New Hampshire, California, Vermont, and New York.

TOURNAMENT (toor'na-ment), a military sport practiced in the Middle Ages by armed knights, usually as an exercise of skill at some great event, as a royal marriage or military festival. The knights were mounted on horseback, the name tournament coming from the skill exercised in turning the horses while taking part in the contest. A single contest between two knights was called a joust, while the name tournament was applied to a number of jousts and to combats among several parties of knights. They were held by the solicitation of princes or nobles, who sent out invitations by heralds, but certain qualifications of birth were required for admission. The contests took place within an open space surrounded by a rope or railing, and around it were galleries for spectators, heralds, and the judges. Each knight carried a light armor, which was generally adorned with some device of a lady's favor. After the prizes were awarded by the judges, they were delivered to the successful knights by the queen of beauty, who received her appointment by the lady spectators.

The practice of holding tournaments reached its full perfection in France and Germany in the 9th and 10th centuries, and was introduced into England shortly after the Norman conquest. In most countries the arms employed were made especially for the purpose, the lances being without heads, while the swords were without points and had blunt edges. The ordinary weapons of warfare were used on some occasions, and it was not infrequent to arouse angry passions that resulted in severe injury or death. Henry II. of France received a fatal wound at a tournament, by which much opposition to the sport was aroused and the practice was finally abandoned with the decline of chivalry. Tournaments were given in America to a limited extent as a sport, but the practice never gained a wide foothold.

TOURNIQUET (toor'ni-ket), an instrument used by surgeons to check the flow of blood from wounds. It consists of a pad to compress the artery, which is held in place by a strong band, and pressure is obtained by a screw that serves to tighten the band. A simple form of the tourniquet may be made by placing a cord between the wound and the heart and applying pressure by means of a stick, which

is used to twist the cord or band.

TOURS (toor), a city in France, capital of the department of Indre-et-Loire, 130 miles southwest of Paris. It occupies an imposing site at the junction of the Cher and Loire rivers, has numerous railroads, and is famous for its manufacture of silk. Two suspension bridges and a fine stone bridge 1,225 feet long cross the Loire. It has a beautiful Gothic cathedral. numerous other churches, a museum, and a library of 60,000 volumes. The inhabitants include many persons of wealth and leisure, who have encouraged the organization of societies devoted to art, science, agriculture, literature, and horticulture. Besides a large output of silk, it has manufactures of stained glass, boots and shoes, carpets, edged tools, paint, pottery, and wine. Tours lost many of its most skilled artisans at the revocation of the edict of Nantes and from that loss it has never recovered. The German army occupied it in the Franco-German War. Population, 1916, 67,601.

TOUSSAINT (too-săn'), François Dominique, surnamed L'Ouverture, distinguished military leader, born near Cape François, Hayti, May 20, 1746; died near Besançon, France, April 27, 1803. He descended from slave parents, being the second son of an African chief who had been captured and enslaved. In 1791 the colored people of Hayti organized a revolutionary movement against France and he joined the insurgents, acting for some time as physician of the forces. Subsequently he became military leader of the insurgents and as such demonstrated eminent ability in conquering the island. The English invaded Hayti in 1793, but France having declared all slaves free, he sided with the latter, and in 1797 forced the English army to surrender. He was soon after made commander in chief of Santo Domingo. His management was upright and vigorous, giving encouragement to trade, agriculture, and internal 2905

improvements. The Spanish forces occupying the eastern part of the island were soon forced to yield their claims, thus making Toussaint the chief influence on the island, which he governed

as president under France.

A constitution was adopted under his direction, which vested the government in a council of nine members, formed of one mulatto and eight white citizens. This constitution was opposed by Napoleon, who soon after issued a To carry proclamation reëstablishing slavery. out this edict he sent an army of 30,000 men and a squadron of 54 vessels under General Leclerc, the husband of Pauline, Napoleon's sis-The expedition was unsuccessful in forcibly conquering the island, but the French general secured the surrender of Toussaint on the condition that the natives would not be reënslaved and no one would be punished for past political offenses. However, the French subsequently seized and carried him to France as a prisoner, and he was committed without trial to the dungeon of the Castle of Joux, near Besançon. He died from neglect after ten months of prison life. The name of Toussaint L'Ouverture has been made famous in literature by Wordsworth and Whittier.

TOWER (tou'er), a building of simple and compact form, usually cylindrical and not much higher than it is wide. The ancients constructed towers only for defense, but later this form was used in lighthouses. In the Middle Ages it became popular to ornament castles and churches with towers, and those used in ecclesiastical buildings usually served for hanging bells, though in Italy the bell towers were near but separate from the churches. Palaces and castles had towers for the purpose of watching or giving signals. Many towers are constructed by Asiatics, such as the minarets on the Mohammedan places of worship and the emblematic towers of Indian and Chinese temples.

TOWER, Charlemagne, diplomat and capitalist, born in Philadelphia, Pa., April 17, 1848. He studied at Harvard University, where he developed ability as a student and thinker, and subsequently became interested in railroading and mining. From 1882 to 1887 he was president of the Duluth and Iron Range Railway, and in the latter year removed to Philadelphia and became the leading spirit in several large corporations. President McKinley made him minister to Austria-Hungary in 1897, which position he filled until 1899, when he was made ambassador to Russia, serving until succeeded by Andrew D. White. He was appointed ambassador to Germany in 1902, serving until 1908, when he was succeeded by David J. Hill. Besides contributing to periodical literature and editing various reports, he published "Catalogue of a Collection of American Colonial Laws" and "Marquis de La Fayette in the American Revolution." He was prominent as a member of many scientific associations and received an appointment as grand officer of the Legion of Honor of France.

TOWER OF LONDON, an ancient structure outside the eastern wall of the city of London, on the northern bank of the Thames. It was begun by Bishop Gundulf under the direction of William the Conqueror in 1078, but remained unfinished for more than thirty years, though various additions and changes have been made since at different times. The buildings occupy a space of thirteen acres, surrounded by a wall with massive towers, and are inclosed within a moat or ditch. In the central part is a massive white tower, the oldest of the structures, and surrounding it are the barracks, chapel, and several other buildings. The Chapel of Saint John is a fine specimen of Norman architecture. The Tower was used as a fortress by the first two Norman kings, and Henry I. made it a state prison. It was enlarged from time to time for prison purposes, being used largely for the confinement of political offenders, but also as a royal palace and as a fortress of defense. Many noted acts of cruelty were committed there, notably the murder of the two young sons of Edward IV., whose lives were taken for political purposes in the so-called Bloody Tower. The Tower of London is now a great military storehouse, containing arms and supplies for a large army. It is equipped with a small military garrison.

TOWNE, Charles Arnette, public man, born in Oakland County, Michigan, Nov. 21, 1858. He studied in the public schools and, after taking a course in law, was admitted to the bar. Soon after he developed a successful law practice in Duluth, Minn., and in 1894 was elected to Congress as a Republican. In 1896 he left the Republican party, owing to its position on the money question. He gave Bryan and bimetallism enthusiastic support in the ensuing campaign, delivering addresses in a number of states. In 1900 he was nominated for Vice President by the People's party, but withdrew to give his support to Bryan and Stevenson. Subsequently he removed to New York City to engage in

financial enterprises.

TOWNSHEND (toun'zend), Charles, statesman, born at Rainham, England, March 10, 1674; died June 21, 1738. He was made second viscount on the death of his father, in 1687, and became associated with the Whig party. In 1709 he was ambassador to Holland, where he signed the Barrier Treaty at The Hague. On the fall of the Whig ministry, in 1712, he returned to England, where he was censured for having signed the Barrier Treaty and was declared an enemy of the kingdom. He became Lord Lieutenant of Ireland in 1717 and for several years served as Secretary of State, from 1721 until 1730. Owing to differences with Sir Robert Walpole, his brother-inlaw, he retired from public life.

TOWNSHEND, Charles, statesman, born

in England, Aug. 29, 1725; died Sept. 4, 1767. He was a grandson of the second viscount, Charles Townshend, and in 1847 entered the House of Commons. In 1754 he was made Lord of the Admiralty, but an attack upon the ministry brought about his dismissal. caused him to be appointed Treasurer of the Chamber, but he went over to the opposition and was made Secretary of War in 1761. Four years later he supported the Grenville Stamp Act and in the meantime introduced the Townshend Acts, which had an influence in hastening the Revolution in America. Owing to his frequent changes in turning to different political factions, he was known as the Weathercock, but he enjoyed a high reputation for wit and oratory

TOXICOLOGY (tŏks-ĭ-kŏl'ð-jÿ), the science that treats of the nature and properties of poison, including their effects and antidotes, and embraces the legal questions connected with poisoning. Any substance which exercises chemical or vital effects upon the body which are injurious to health or life is termed a poison. The term vital effects has reference to the influences of poison that are probably due to chemical action, but the means available at present do not enable us to understand them clearly. The effect of a poisonous substance may be local or general, but the quantity is a determining factor, since small doses may be taken without injury to the system. Entrance into the body may take place in a variety of ways, in addition to the more usual way of passage through the mucous membrane of the stomach, after swallowing. These include entrance through open wounds, by subcutanaeous inoculation, and through scratches or openings in the skin. Sometimes the system is entered by volatile poisons being inspired with the air. Poisonous substances, to act effectually, must be in the liquid or gaseous state. See Poison.

TRACERY (trā'sēr-y), in architecture, the ornamental pattern work traced in the head of a Gothic window or gallery. The tracery is perforated for the purpose of admitting the light, usually to further add to the decorations of the building, whence it is sometimes called openwork. Styles known as flowing and flamboyant were first used in the 13th century, and to these was subsequently added the geometrical style. When work of this character is applied to ceilings or panelings, it represents a pattern carved on a solid surface in the nature of bas-relief.

TRACHEA (trā'kê-à), or Windpipe, the tube situated in the middle line of the neck, beginning at the larynx and terminating in two smaller tubes called bronchi. Through the larynx it communicates with the nose and mouth, and through the bronchial tubes it has connection with the lungs. It is from three-fourths of an inch to an inch in diameter and is held open by incomplete rings of cartilage. These rings are transverse, from sixteen to twenty in

number, and are held together by muscular and elastic fibers. The tube is completed at the back part by a muscular membrane and within is a layer of ciliated epithelium. Secretions from mucus glands moisten the surface of the membrane, and the cilia have a resisting influence that causes anything coming in contact with them to be drawn toward the mouth. The removal of phlegm is explained by this action of the cilia.

TRACHEOTOMY (trā-kē-ŏt'ō-my), a surgical operation by which the trachea is opened. It is sometimes necessary in certain diseases, such as affect the larynx, or upper portion of the air passages. They include croup, quinsy, diphtheria, and acute laryngitis, and the purpose is to admit air into the lungs to prevent suffocation. Sometimes this operation is resorted to when a foreign body has become so fixed in the air passages as to completely obstruct the transmission of air through the trachea, or when the throat has been cut. The operation does not contribute toward curing the disease or relieving an obstruction, but merely furnishes a means of enabling the patient to breath through the artificial opening thus provided. An incision is first made in the median line of the throat, either below or above the thyroid gland, and the muscles and vessels are pushed aside until the trachea is exposed. A vertical incision is made in the trachea as soon as the bleeding has ceased, and a silver canula is inserted, which sometimes requires the removal of a part of one or more of the rings. The canula is removed when the natural respiration has been restored.

TRACHYTE (trā'kīt), an igneous rock, so named from the roughness of its surface. Rocks of this class are composed chiefly of silica, alumina, magnesia, and oxide of sodium. The colors are usually light, but in some cases are shaded with grayish and darker markings. When feldspar, augite, and hornblende predominate, the rock is classed with varieties of trap, such as basalt and greenstone.

TRACT, a brief treatise on any theme of interest, especially one that treats a religious subject. A tract differs from a book mainly in that it is a short treatise upon a subject and resembles a pamphlet in folding and external appearance. Tracts were published extensively in many countries during times of great religious agitations. A series of papers known as Tracts of the Times were published in England between 1833 and 1841 and those who promoted the movement were termed Tractarians. It was sometimes called the Oxford Movement, since it originated at the University of Oxford, and favored greater ritualism in the Anglican Church.

TRACTION ENGINE, an engine that serves the double purpose of furnishing power and propelling itself. Engines of this kind are used extensively for agricultural purposes,

especially in threshing, since they furnish the power to operate the separator as well as to remove all the machinery engaged in threshing from place to place. The first steam engines used for this purpose were not constructed on a plan of self-propulsion, hence it was necessary to remove them from place to place by means of horses. Those in common use have a horizontal boiler and a high-pressure engine and are mounted upon four wheels. The front wheels are comparatively small and are steered by a mechanical apparatus, while the rear wheels are large and have broad and heavy tires. An adjustable gear permits attaching the engine to the rear wheels when the machinery is to be propelled over the road, but it is detached during the time ordinary work is done. Engines of this kind range from ten to twenty horse power. Gasoline engines of smaller size are used to some extent for the same purpose.

TRACY (trā'sĭ), Benjamin Franklin, statesman, born in Oswego, N. Y., April 26, 1830. He studied law and built up a successful practice in Tioga County, New York, of which he was district attorney in 1854 and 1856. In 1862 he served in the New York Legislature and was soon after appointed by Governor Morgan as a recruiting officer for the Union army. He commanded a regiment in the battles of the Wilderness and Spottsylvania, and was later put in charge of the prison camp at Elmira. He was brevetted brigadier general of volunteers at the close of the war. From 1866 to 1873 he served as United States district attorney, was judge of the New York supreme court from 1881 until 1883, and served as Secretary of the Navy under President Harrison from 1889 to 1893. Subsequently he resumed a successful law practice in New York City. Among the important cases in which he was counsel is the Tilton-Beecher case, serving for the defense. He died Aug. 6, 1915.

TRADE-MARK, a symbol fixed by a merchant or manufacturer to distinguish particular goods from similar products made by others. The principal objects in carrying a trade-mark are to enable purchasers to distinguish certain meritorious commodities in the market, to enable the producers of such articles to profit by their sale, and to guard against imitations being sold for a particular make of goods. Most countries register trade-marks at a nominal fee. In the United States they are registered in the patent office at Washington, D. C. The fee is \$25 for the term of thirty years, after which it may be renewed. In Canada the trade-marks are registered for 25 years with the Secretary of Agriculture at Ottawa, the fee being \$25 for a specific trade-mark and \$30 for a general Labels are used in printing and trade-mark. other lines for the same purpose, especially to indicate union-made goods. The fee for a label is \$5.

TRADES UNIONS, the associations of

workingmen organized to promote the general and material welfare of the members. The trades unions embrace usually only laborers of the same trade. These organizations are very numerous in Canada and the United States, scarcely any kind of labor being without some form of organized association for mutual aid and protection. The specific objects of the different unions are to regulate the wages and hours of work, to restrict the number of laborers to the actual needs of a particular trade, and to promote intelligence by lectures and the circulation of literature. These organizations are likewise helpful in that they grant benefits to the sick and disabled, relieve those in distress, and provide certain insurance and burial benefits. As a means of mutual defense and intelligence, they add to the value of a man, especially since they tend to increase production and secure for the laborer a constantly growing proportion of the joint product of labor and capital. However, the tendency to limit the number of laborers, especially if effected extensively, has the economical result of diminishing the product and increasing the price.

That trades unions as a whole are beneficial to the workingmen is evidenced by the fact that . the best wages and highest intelligence among the working classes are found where they are in a high state of perfection, and, on the other hand, the lowest wages are paid where unions do not exist. The International Typographical Union, organized in 1852, was the first to be formed in the United States. The Machinists' and Blacksmiths' International Union and the Iron Molders' Union of North America were organized in 1859. The Brotherhood of Locomotive Engineers was founded in 1863, the Cigar Makers' International Union in 1870, and the Miners' National Union in 1873. Many others of national and local importance are maintained. In 1894 the power of the American Railway Union became manifest, when its president called out the railroad employees in support of the strike in which the laborers of the Pullman Car Company, Chicago, were interested. This action caused a general derangement of the entire railway system of the United States for a period of three or four weeks, and disturbances were quelled only by the interference of the general government. The American Federation of Labor is an organization formed by an alliance of different national trades unions. The unions in Great Britain have a membership of 1,650,000 and an accumulated fund of \$24,500,000. Similar organizations are maintained in France, Germany, and other countries

of Europe. See Labor. TRADE WIND. See Wind.

TRADING COMPANY, the name applied to any one of several great associations promoted in Europe for the promotion of trade and to extend the colonial interests. Such organizations were promoted extensively in the 16th

and 17th centuries. Those most noted in America are the Hudson's Bay Company, the Virginia Company, and the Massachusetts Bay Company, and through their operations were established the leading British colonies in America. The British East India Company and the Dutch East India Company were two powerful organizations in the exploitation of colonies in Asia. The business was managed by a board of directors, who chose its own officers in most cases, and the members held interests much the same as is the case in a joint-stock company. In most cases they were authorized by the authority of the government as a means of founding colonies and incidentally to promote trade and develop resources. See Hudson's Bay Company.

TRAFALGAR (trăf-al-găr), a cape on the southern coast of Spain, projecting into the Atlantic, at the entrance to the Strait of Gibraltar. It is memorable as the scene of a great naval victory by the British fleet under Nelson over the allied fleet of Spain and France under Villeneuve, on Oct. 21, 1805. The allied fleet had 40 vessels and the British had 33, but in the engagement 19 of the former were captured. However, Admiral Nelson was fatally wounded in the encounter.

TRAGACANTH (trăg'a-kănth), the name of several species of shrubs found in Asia Minor, belonging to the pulse family. These plants yield the tragacanth of the market, a gum valuable in medicine and for calico printing. It is a hard substance, has a slight taste and no smell, and is difficult to pulverize. When placed in water, it absorbs the liquid and forms an adhesive paste. Though similar to gum arabic, it differs from it in a few chemical properties. As a medicine it is used for treating coughs and catarrhs.

TRAGEDY (trăj'ê-dy). See Drama.

TRAGOPAN (trăg ô-păn), or Horned Pheasant, a species of the crested pheasants, found chiefly in China and India. The bill resembles that of the common fowl, the tail is rounded, and the plumage is variously colored. Instead of a comb, the male has a crest of soft feathers, has two hornlike appendages above the eyes, and is wattled in front on the throat. The appendages are protractile and retractile at will. In their habits they are generally solitary and dwell in the recesses of their native forests. The food consists of grains, roots, and insects. Five species of these birds have been described.

TRAILING ARBUTUS (trāl'īng ār'būtus), an evergreen trailing plant, sometimes called ground laurel and mayflower. A number of species have been enumerated, most of which are American. The flowers are white or pinkish, growing usually in clusters, and are noted for their excellent perfume. These plants are admired for their beauty and the fine-scented flowers, but are quite difficult to transplant. The dried leaves of species called the red bearberry

are used as an astringent and tonic medicine. They possess medicinal value in treating chronic affections of the bladder.

TRAIN, George Francis, author, born in Boston, Mass., March 24, 1829; died Jan. 18, 1904. After engaging in business enterprises in Boston, he made a trip to Australia in 1853, and subsequently promoted street railway building in Liverpool. He made a financial failure in the latter enterprise and began to write for periodicals and to lecture. His addresses became well known because of spicing them with criticisms of English society. In 1862 he settled in New York City and subsequently devoted himself entirely to lecturing and literary work. His publications include "Young America on Slavery," "Young America Abroad," "Spread-Eagleism," "An American Merchant in Europe, Asia, and Australia," "The Downfall of England," "Every Man His Own Autocrat," and "The Championship of Women."

TRAJAN (trā'jan), Marcus Ulpius, emperor of Rome, born near Seville, Spain, Sept. 18, 52; died in Selinus in July, 117 A. D. He

descended from a family of Roman origin and showed early military skill in the campaigns against the Parthians and the Germans on the Rhine, in the reigns of Titus and Domitian. His distinguished services caused his appointment to the consulship in 91, and Nerva created him Caesar in 97. On the death



TRAJAN.

of Nerva, in 98, Trajan returned from Germany and ascended the throne, making large gifts to the Roman citizens and soldiers. He concluded peace with the German tribes, introduced reforms in the public service, and in 101 led a large army from Rome against the Dacians, making their country a Roman province in 105. While on this foreign campaign, in 103, he directed an epistle to Pliny, governor of Bithynia and Pontus, in which he instructed that official not to heed anonymous charges against Christians.

Trajan entered upon an extensive campaign to the East in 106, annexing Armenia, Parthia, Arabia, Mesopotamia, and other regions. He crossed from the Caspian Sea to the Indian Ocean and was the first Roman to explore the Persian Gulf. The government of Trajan is noted as one of the most vigorous and efficient of Rome. He adorned Rome with splendid buildings and bridges, built canals and highways, and founded new cities. The Trajan column, a famous structure still to be seen at Rome, was built to commemorate his victory over the Ger-

mans. Trajan's wall, extending from the Black Sea to the Danube, is another remarkable work constructed in his reign. The Roman Empire reached its greatest extent under Trajan, and it was said of him that he never permitted a Roman army to be defeated. He founded several libraries at Rome, the most celebrated of which was the *Ulpia Bibliotheca*. Hadrian succeeded him as Roman emperor.

TRAJAN, Arch of, an arch constructed by the Romans at Benevento, Italy. It was erected in 114 A. D. to commemorate the completion of a new road from Rome to Brundisium. The material used is white marble. It is 50 feet in height and has an archway 27 feet high. Trajan's triumphs over the Dacians are represented by elaborate reliefs. This arch is in a good state

of preservation.

TRAJAN'S COLUMN, a column erected in ancient Rome to commemorate the reign of Trajan. It was ordered by the senate, completed in 114 A.D., and still stands erect in its ancient beauty. The location is in the midst of the ruins of the Forum of Trajan, a group of public buildings that occupy the space between the Capitoline and Quirinal hills. It is 100 feet high and originally was crowned with the statue of Trajan, but Pope Sixtus V. replaced it with one of Saint Peter. The reliefs are chiefly scenes in the triumphs of Trajan over the Dacians, but in addition include records of ancient costumes and military operations.

TRAJAN'S WALL. See Trajan.

TRAMWAY (trăm'wā), a somewhat primitive kind of railway, either for use upon streets or through country districts. In most cases the grading is not as uniform as for electric and steam railways, the rails are made of wooden stringers laid upon ties, and the upper part is protected by straps of iron. Horses and mules are used to move the cars. In the better class of tramways locomotives are employed, though they are usually narrow gauge and of small size. Tramways preceded steam and street railway construction. The first used in the industries were completed in England to transport stone from the quarries to the ports for shipment by water.

TRANCE (trans), a state resembling sleep, in which the power of volition is suspended and the vital organs are almost inactive. The body, when under the influence of a trance, assumes a ghastly pallor and merges into a state of apparent death. Circulation and respiration cease. Many cases are on record in which persons were actually buried alive, as shown by subsequent exhumations. Trance is associated largely with intense mental exultation and preoccupation, and may simulate death, though patients in most cases recover. Death trance is a condition in which neither the heart nor lungs acts and the temperature of the body falls; trance coma is characterized by feeble breathing and action of the heart; and trance sleep is an abnormally profound and prolonged sleep in which the patient cannot be awakened by external stimuli.

TRANSCENDENTAL (trăn-sen-den'tal). a term applied to ideas and doctrines that are not suggested or limited by experience. Classical writers usually gave the name to anything that rose above or could not be defined by the ten categories of Aristotle. Thus, the state of being was termed transcendental. The name transcendentalism is used by Kant in relation to transcendental elements, of which, according to his view, there can be definite knowledge. Among English-speaking peoples the term is applied to a school of thinkers confined chiefly to New England, which flourished from 1830 to 1850. The leading supporters of this movement include George Ripley, who founded a noted transcendental club in 1826. Others that may be mentioned are James Freeman Clarke, Ralph Waldo Emerson, Margaret Fuller, Theodore Parker, and A. Bronson Alcott. The leading tenet of these thinkers is that mind is supreme over matter. They held the view that spiritual truth clearly presented can be perceived by the inborn faculty possessed by every person and that in the soul is an unerring witness to the truth of religion, which they maintained does not depend upon historical facts or tradition. The ideal set up by the leading transcendentalists is "plain living and high thinking."

TRANSFORMER (trăns-fôrm'er), an apparatus for changing the potential of electric currents, so called because it may transform or change the value of the electric motive force in the primary and secondary circuits. A form of the induction coil is commonly used to transform the current from a high to a low potential, as in taking current from the main wires to supply incandescent lights, either individually or in series. Such a transformer consists of a primary and a secondary circuit, in which the primary, or inner, coil has a larger number of terms than the secondary, or outer, coil. In alternatingcurrent transformers the primary and secondary coils are usually placed parallel to and alongside each other. They are provided with a core of laminated iron and the same material surrounds the coils, which insures the greatest amount of magnetic flux passing through them. Transformers are usually placed outside of buildings or on high poles to insure safety, since alternating currents with high electric motive force

are dangerous.

TRANSFUSION OF BLOOD (trăns-fū'-zhūn), the term applied to the injection of blood into a person as a means of treating disease or invigorating the system. The blood thus used may be drawn from a brute or a human being, and it may be injected directly from the vein of one to that of another, or it may first be defibrinated. In medical science it has been known for more than four centuries, but it was rarely practiced prior to 1824, when Dr. Blundell published his "Physiological and Pathologi-

cal Researches." Blood drawn from sheep, dogs, and pigeons has been used to a considerable extent, but the results have proved doubtful. Many cases are on record in which the patients appear to have been benefited, while others seem to indicate that the practice does not possess material value. In theory it is certainly useful, since it replenishes the older and partially diseased tissues with new blood that is calculated to build up vitality and restore impaired or dissipated strength. Saline solutions of various kinds are now infused into the veins instead of blood. Such solutions consist essentially of sodium chloride, about 0.6 per cent., which is the proportion in normal animal tissues. It is raised to a temperature of about 110°, the quantity being from one to two pints, and has been found beneficial in sudden losses of blood or where the patient suffers from a severe shock.

TRANSIT (trăns'it), in astronomy, the passage of one heavenly body over the disc of another, as of Mercury or Venus over the disc of the sun, or of a satellite over the disc of the planet around which is revolves. The term is restricted principally to the passage of the inferior planets, Mercury and Venus, over the disc of the sun. About thirteen transits of Mercury occur every century, the shortest interval between them being about three years and the longest thirteen years. They occur in the early part of May and November, because the earth is then near the nodes of Mercury's orbit. Transits of Venus are of importance in astronomy, since the best means of determining the sun's distance from the earth is afforded by them. They occur at intervals of eight, 105, eight, and 122 years. Both Mercury and Venus are nearest the earth at transit, and their apparent motion is westerly, hence a transit always begins on the

The transit of Mercury was observed first by Gassendi, in 1631, and the first of Venus was announced by Jeremiah Horrox in 1639. The dates of Mercury's transits are Nov. 5, 1868; May 6, 1878; Nov. 7, 1881; May 9, 1891; Nov. 10, 1894; Nov. 12, 1907; Nov. 6, 1914; and May 7, 1924. The transits of Venus have the following dates: Dec. 7, 1631; Dec. 4, 1639; June 5, 1761; June 3, 1769; Dec. 9, 1874; Dec. 6, 1882; June 8, 2004; and June 6, 2012. A transit instrument is used for observing the exact time or measuring the passage of heavenly bodies across the meridian. This instrument resembles a theodolite and consists principally of a horizontal, graduated circle, with leveling devices, clamping screws, a compass, and a telescope. It ranks as the most important of the technical astronomical instruments.

east side of the sun.

TRANSMIGRATION (trăns-mǐ-grā'shǔn), or Metempsychosis, the doctrine of the passing of the soul at death into another mortal body. Those who support the view that the soul transmigrates at death believe that there is a repeated existence of the soul and that its form in

each succeeding state is determined by its merits and demerits in the preceding one. Many ancien, civilizations grew out of this faith, especially those of Egypt and Asia. This doctrine regards human life on the earth as only one link in a chain of conditions through which the soul passes in its long career of procession from God until it returns to Him.

Brahmanism represents the migration after death into the body of a higher or lower life as a reward of virtue or penalty for vice. The soul may even deteriorate into the lowest animal forms or the vegetable or mineral world. Before it reaches to human consciousness it accomplishes numerous transmigrations, but if the reason and freedom permitted in this life are not utilized to good advantage, the soul is liable to return and begin the series again. A long period of divine years is assigned for the completion of all transformations and the process of purification, after which it ultimately receives its reward in what is described as a state of blissful adsorption into the divine nature. According to Herodotus, the Egyptians believed that the soul is clothed successively with the forms of all the animals that live on the earth and after a long cycle of years it enters the body of a man, when it begins its eternal pilgrimage. The Buddhists hold to a doctrine of transmigration, but differ from the Brahmans in that they believe in the ultimate annihilation of the soul, which is said to take place in Nir-

The doctrine of transmigration had a prominent place in the philosophy of Pythagoras, hence came to be deeply rooted among the Greeks. He maintained that the soul has a life peculiar to itself, which it enjoys in common with demons and spirits before it descends to the earth, and that there must be a degree of harmony between the faculties of the soul and the form which it assumed. At death the soul becomes freed from the fetters of the body and remains for a time in the realm of spirit, when it returns to the earth to accomplish again the process of purification through a series of animal and human bodies. Plato adopted the doctrine and maintained the preëxistence of the soul before it appears in man, of which condition it retains dim recollections, and after death it chooses another body according to its peculiar qualities. He thought that every soul returns to its original source after a long cycle of years, but certain periods are to be passed in the infernal world. Mention of the doctrine is made by Cicero and Caesar. It is referred to in the Talmud and was supported by heretical sects among the early Christians. While the general belief in transmigration seems to be permanent in the East, it has been defended by a few metaphysical writers in America and Europe.

TRANS-MISSISSIPPI EXPOSITION, an industrial exhibition of the United States, held at Omaha, Neb., in 1898. It was designed to

<u> </u>		
	÷	



hp 2911)

MODERN MEANS OF TRANSPORTATION.

Upper View—Aeroplane (speed from 30 to 112 miles per hour). Central View—Electric Three-rail Railway (speed from 30 to 130 miles per hour). Lower View—Automobile (speed from 30 to 132 miles per hour). display the progress made in the arts and industries of the section of country lying west of the Mississippi and to extend the general interest in the development of its extensive resources. The tract occupied by the grounds included 200 acres in the northern part of the city, overlooking the Missouri River. Many states had buildings, or made special exhibits, and a fine display was made by the Federal government. The architecture was elaborate and the grounds were ornamented with fine shrubs, trees, and flowering plants. A total attendance of 2,613,508 was registered.

TRANSPORTATION, the industry of carrying persons and goods from one place to an-The means of transportation depend other. upon the development of trade within a country and are influenced noticeably by the complexity of its economic system. Anciently trade was carried largely by water, at which time internal commerce was necessarily limited. The first steps toward the development of means of inland transportation is found in the construction of canals and highways, and the first important systems of these avenues were developed in Modern transportation greatly overshadows that of ancient times, both upon land and sea, owing to the application of steam in navigation and the construction of railway and electric lines.

Transportation has greatly added to the comforts of mankind, chiefly through the fact that modern methods permit rapidity and insure a high degree of safety. Although it must be admitted that losses of considerable extent attend the enterprise of conveying passengers and goods rapidly and at great distances, yet there is greater security than prevailed under the methods of the ancients. Modern steamships are constructed of steel and other durable materials, and their great size and accuracy of movement render them much more secure than the inadequate and wooden structures of former periods. On the other hand, the losses by accidents on railways are comparatively small, especially when considered in the light of dangers that attended the slow-moving caravan that furnished the chief means of transportation in Asiatic countries for long periods. It is now possible to gain the advantage of travel, both within one's own country and abroad, and this factor in civilization is taken advantage of more extensively as the means of travel are extended. Besides, the products of different belts of climate and soil may be enjoyed by the people in a condition as favorable as where they were produced. This has given rise to the use of a larger variety of commodities and has brought the greater benefits of many localities to the homes of those who would otherwise be entirely deprived of them. See Commerce; Interstate Commerce; Navigation; Railroads.

TRANS-SIBERIAN RAILWAY. See

Railroads.

TRANSVAAL (trăns-väl'), a British colony in South Africa, lying north of the Vaal River, which separates it from the Orange River Colony. It is bounded on the north by Matabeleland; east by Portuguese East Africa and Swaziland; south by Natal and the Orange River Colony; and west by Bechuanaland and the Bechuanaland Protectorate. It has an area of 117,732 square miles, of which 6,536 square miles are included in Swaziland, a dependency.

DESCRIPTION. Most of the interior is an elevated plateau ranging from 3,500 to 6,000 feet above sea level. It is divided into the two regions known as Grass Veldt and Bush Veldt. The former is an arid tract covered with nutritious grasses. The Bush Veldt is well wooded and comprises the valley of the Oori Limpopo, or Crocodile, River and a narrow strip along the eastern border. In the east central part are ranges of the Drakenberg Mountains, which extend north and south through the country and reach their highest summits in Mauch Mountain, height 8,975 feet. The Limpopo Mountains form the eastern boundary, separating the country from Portuguese East Africa. A range of highlands extends through the country from east to west, known as the Witwatersrand, with a general elevation of 6,000 feet, which form the watershed between the Vaal and the Oori Limpopo rivers. Ranges extend from the main ridge both north and south.

The northern boundary is formed by the Oori Limpopo River, which furnishes the main drainage. It receives the inflow from the Olifant River after the latter crosses the eastern border into Portuguese East Africa. A large part of the southern boundary is formed by the Vaal, a tributary of the Orange River. Swaziland is drained mainly by the Maputa, which discharges into Delagoa Bay, an inlet from the Atlantic. The Transvaal is an interior country, having no sea coast, and none of its rivers is navigable. The climate is favorable to Europeans, and in the northern part assumes a subtropical character. July is the coldest month and January is the warmest. The mean temperature is 67°. Frosts occur in winter, but chiefly in the highlands. Rainfall is abundant in the valley of the Oori Limpopo and the eastern section, where it averages 28 inches, but it is scant in the western part. Acacias, the eucalyptus, and other trees native to warm climates thrive in the fertile and well-watered parts.

INDUSTRIES. Mining is the principal occupa-tion, and gold, coal, and diamond are the chief minerals. Barberton and the Witwatersrand have the most productive gold fields, and the total output for the colony is about \$125,500,000 per year. Coal is produced for export to other points in Africa and to European countries. The output of diamonds is placed at \$5,500,000 per year. Other minerals include tin, copper, silver, lead, iron, cobalt, platinum, and plumbago, but these have not been developed extensively.

Agriculture is possible only in a limited district without irrigation, and improvements of this character are not extensive at present. The farms are usually of large size, and stock raising is a more important department than the cultivation of the soil. Kaffir corn, wheat, barley, and oats are the principal cereals. Vegetables and fruits are grown successfully. Stock raising is a very important industry, the climate and native grasses being highly favorable to this enterprise. Cattle and sheep are grown extensively and large interests are vested in horses, swine, and ostriches. Tobacco of a good quality yields well. Much of the farming is in the hands of Europeans, but labor in the mining and manufacturing industries is furnished largely by Chinese and natives.

A large part of the manufacturing is in connection with the mining and is represented by smelters and machine shops. Flour and grist mills, brick and tile works, breweries, and iron and brass foundries make up the chief enterprises. Among the general manufactures are malt liquors, brick and tile, cigars and pipe tobacco,

clothing, and machinery.

The railroads in operation include 3,125 miles and are connected with those of the Orange River Colony. A branch extends from Pretoria east to Lourenço Marquez, on Delagoa Bay. The total length of telegraph lines is 3,250 miles. Gold, diamonds, live stock, wool, coal, tobacco, and lumber are the principal exports. The imports consist chiefly of textiles, foodstuffs, chemicals, clothing, and machinery. A large majority of the trade is with Great Britain.

GOVERNMENT. A responsible government was established in 1906 by letters patent. The Governor and Lieutenant Governor are assisted by an executive and a legislative council. Authority to legislate is vested in the legislative council and legislative assembly. Members in the former are appointed by the Governor, while those of the latter are elected for five years. All laws and public documents are printed both in the English and Dutch languages.

A free public school system was established in 1907. The attendance at the schools is obligatory for white children between the ages of eight and fifteen years. Both English and Dutch are taught in the schools. High schools are maintained in the towns and cities. The Transvaal Technical Institute, located at Pretoria, carries courses in mining, engineering, and commerce.

The schools and institutions are nondenominational.

INHABITANTS. The people residing in the Transvaal include many races, both native and European. In 1911 Swaziland had a total population of 85,484, of which 898 were whites. The Transvaal in the same year had a population of 1,676,611, which included 420,831 whites. The Europeans include principally British, Russians, Germans, Dutch, and Italians. Several thousand Americans and Australians reside in the

colony. A large majority of the Christians belong to the Dutch Reformed Church. Other religious denominations include Anglicans, Roman Catholics, and Jews. Pretoria, in the central part, is the capital. Johannesburg, the center of the Witwatersrand, is the largest city. Other cities include Barberton, Nylstroom, Heidelberg, and Lichtenburg.

HISTORY. The Transvaal country was first settled by Boers in 1845, these sturdy and industrious people leaving Natal in that year owing to its annexation as a colony by Great Britain. They were direct descendants from the Dutch who established a port of call near the Cape of Good Hope in 1662. When the British annexed the Cape Colony, in 1814, large numbers of Boers settled in Natal, and subsequently in the Orange province and the Transvaal. The British government recognized the independence of the Transvaal in 1852, but in 1877 assumed general sovereignty. In 1880 the Boers made a successful armed effort for independence, the war terminating by a disastrous defeat for the British at Majuba Hill, and in March, 1881, the inde-

pendence of Transvaal was again recognized.

In 1884 the British made another effort to annex

the Transvaal and, after conducting compli-

cated diplomatic proceedings, secured a partial sovereignty.

The discovery of gold in the Rand, in 1885, caused the British to seek further influence, leading eventually to the untimely Jameson Raid of 1896, which proved an unsuccessful venture to annex the republic. War was finally declared by the republic on Oct. 11, 1899, and the Orange Free State immediately cast its fortunes with the Transvaal, Great Britain manifesting a disposition to annex both republics as a means of protecting the interests of many subjects who had made settlements within the region. The first battle of importance occurred at Ladysmith on Oct. 30, when the British met a reverse. Subsequently the Boers were defeated in a number of engagements, though they made a stubborn resistance, and on Oct. 25, 1900, the region was annexed by Great Britain. In 1907 the government greatly restricted the immigration of Asiatics, especially Chinese, as a means of protecting native laborers. In 1910 it was joined with Cape Colony, Natal, and Orange River Free State to form the Union of South Africa.

TRANSYLVANIA (trăn-sĭl-vā'nĭ-à), in German Siebenbürgen, a principality in the southeastern part of Austria, belonging to the Austro-Hungarian Empire. The area is 21,518 square miles. It lies between the Carpathian and Transylvanian mountains, the boundary being formed by Galicia, Rumania, and Hungary. The surface is largely mountainous, but it has many fertile valleys and plains. Among the chief rivers are the Maros, Körös, Aluta, and Szamos, all being tributary to the Danube. Gold, silver, copper, quicksilver, coal, lead, iron, salt, alum, tin, limestone, and precious stones are among

the minerals. Fine forests are abundant, especially along the streams and in the mountains. Agriculture is the leading industry, the products being wheat, hemp, maize, rye, barley, flax, tobacco, vegetables, and fruits. Stock raising, silk culture, and manufacturing are likewise important industries. The manufactures include silk and woolen textiles, soap, paper, furniture, jewelry, glass, gunpowder, and machinery. Education is still in a backward condition, but common schools have been established in all parts of the principality. A university is maintained at Klausenburg and secondary schools flourish in a number of the leading cities. Railroad lines have been constructed through most of the regions producing minerals and containing arable lands. The chief cities include Kronstadt, Klausenburg, Hermannstadt, and Bistritz. A large number of the inhabitants are Germans, but the population includes Bulgarians, Jews, Magyars, Rumanians, and Gypsies. Transylvania belonged to Dacia at the time of the Roman Empire, but with the decline of Rome passed successively to the Huns, Lombards, Goths, and other conquerors. It has been a part of Austria since 1713. Population, 1916, 2,516,500.

TRAP, or Trappean Rock, the name generally applied to the primary and secondary strata of igneous rocks. The term is derived from the Swedish word trappa, meaning a stair, and is given to these rocks because their greater hardness resisted erosion, thus making them stands out on hills and mountains like steps or stairs. They are formed chiefly of hornblende and feldspar. Those in which feldspar predominates are known as feldspathic trap and those composed largely of hornblende are called hornblendic trap, or greenstone. The latter is of a greenish color and is peculiarly crystalline. Feldspathic trap resembles flint in compactness and is of a light bluish or greenish color. Other species of trap rocks include the clinkstones, basalts, pitchstones, feldspar, porphyries, and claystones. Basalt is the heaviest of the trap rocks and is likewise the hardest and most compact. Rich agricultural soil is produced by the decay of trap rock, and districts having these rocks are usually quite fertile. Deposits of hypersthene rocks are abundant in Labrador. Several choice varieties of trap occur in the Isle of Skye

TRAPANI (trä på-nē), a city of Sicily, capital of the province of Trapani, 45 miles west of Palermo, with which it is connected by railway. It is important as a seaport and has a municipal palace and several fine churches. The industries include salt works, shipyards, fisheries, and flouring mills. It has a large trade in wine, olive oil, marble, shell cameos, and fruits. The Carthaginians fortified the place in the 3d century B. C., but it was soon after captured by the Romans. Anciently it was known as Drepanum. Population, 1916, 59,854.

TRAPDOOR SPIDER, the name of a spe-

cies of spiders found in warm climate, so called from the manner in which they construct their nests. The body is hairy and quite large. Several species are common to southern California, Mexico, and the warmer parts of Europe. These spiders dig a burrow in sloping ground, usually six to ten inches deep, and cover the same with a trapdoor made of silk. The interior is usually lined with silk, and the door is attached by a hinge so it may be easily opened and closed. When within the burrow or nest, the spider, on the approach of danger, holds the door down with its mandibles and feet. Some species construct two or more of these nests and connect them below the surface with tubes large enough for passage. The young live in the burrow for several weeks, where they are fed on insects and worms, and soon construct nests for themselves.

TRAPPING, the art of catching birds and other animals by means of traps and snares. This mode of taking game is preferred in that the skin and flesh are less liable to injury than by the use of weapons. Traps for catching various animals, such as the mink, beaver, and fox, are usually made of steel and vary in size according to the kind of animal to be taken. The small traps have one steel spring, while those of larger size usually have two. The trap is set near the hole or habitation of the animal and is securely anchored so as to hold the captive. Usually the trapper sets a bait to allure the animal to the place where it may be caught, and usually visits each trap once or twice a day to remove the captives. Snares are commonly used to catch birds and some quadrupeds, and in many cases box traps are employed for the same purpose. In some countries the use of box traps is forbidden, especially in catching such birds as the quail

TRAVELER'S TREE, a tree native to Madagascar, classed as a kind of plantain, having a palmlike appearance. The stem is smooth and without branches to a height of twenty to thirty feet, and at the top is a peculiar growth resembling a large fan. The leaves grow on extended stalks, which are on opposite sides of the upper stem of the tree, the lower leaves dropping off as the stem grows. A large tree has from fifteen to thirty leaves, the leaf stalks being ten feet in length. The leaves are five to six feet long and frequently about three feet wide. The color of the leaves is bright green. They are used for thatching, while the leaf stalks serve in constructing walls and other parts of buildings. A succulent fruit, growing in bunches, is produced amid the leaves, and the seeds yield a flour utilized by the natives as a food. The tree derived its name from the hollow leaf stalk, which contains a wholesome water even in the dry season, and is used by travelers in quenching thirst.

TRAVERSE CITY (trăv'ers), a city in the northwestern part of Michigan, county seat of Grand Traverse County, at the southern end of the western branch of Grand Traverse Bay. It is on the Grand Rapids and Indiana, the Père Marquette, and the Manistee and Northeastern railroads. The bay is an inlet from Lake Michigan, extending inland about thirty miles. In the southern part it divides, and between the eastern and western arms is a tract of land known as Preogenese Point. Traverse City has fine steamboat facilities and is a favorite summer resort. Cereals, grasses, fruits, and live stock are grown in its vicinity. The chief buildings include the county courthouse, the public library, and the Northern Michigan Insane Asylum. Among the manufactures are lumber, furniture, woodenware, cigars, clothing, and machinery. Electric lights, payements, waterworks, sewerage, and street railways are among the improvements. It was settled in 1850 and incorporated in 1895. Population, 1904, 11,237; in 1910, 12,115.

TRAVERTINE (trăv'er-tin), a species of limestone. It is usually whitish in color and occurs in masses deposited by the action of rivers and springs. Fossils of leaves and twigs are common in some deposits. Many buildings of Rome are constructed of this class of rock.

TRAVIS, William Barrett, soldier, born in Edgefield County, South Carolina, in 1811; died March 6, 1836. He studied law, was admitted to the bar in 1830, and established a successful practice at Claibourne, Ala. In 1832 he went to Texas, where he joined the party that favored Texan independence. He commanded a force of 140 men at Fort Alamo, which was besieged in 1836 by a large detachment of Mexicans. The Americans defended the fort for ten days, when the six remaining alive were compelled to surrender, but they were ordered cut to pieces by Santa Anna. During the siege 32 escaped and vainly attempted to send reinforcements.

TRAWLING (tral'ing), a method of fishing in the deep sea. It consists of dragging a net along the bottom behind a boat, or by attaching the ends to two small steam vessels, which move slowly and pull the net. A trawl or beam trawl is a purse-shaped net from fifty to seventy feet long, and the mouth is held open by a wooden beam. This net is drawn by a single boat, or larger sizes, in which the mouth is forty feet wide, may be pulled by two vessels. Trawling can be done only where the bottom is smooth or sandy, and is usually not permitted near the shore. Much of the fishing in the German ocean is by this method, where large quantities of herring, haddock, and mackerel are taken. The term trawl is applied in America to a long line to which short lines with baited hooks are attached

TREADMILL (trěďmil), an appliance used to discipline prisoners, employed formerly in Great Britain. It consists of a wheel in the form of a long cylinder, furnished with steps around its circumference, and is moved by the tread of the prisoners. A hand rail furnishes support, and the weight of the prisoner causes

the wheel to revolve about twice per minute. Formerly it was customary to utilize the motive power of the treadmill for grinding corn and turning machinery, but the labor expended upon it is too large in proportion to the usefulness of this contrivance.

TREASON (trē'z'n), the crime of levving war or committing any act of hostility against a state by one who owes allegiance to it. The punishment for this offense is very severe, since the crime is held to be one of the greatest of which any citizen may be guilty. Those who know of the crime of treason and fail to disclose the fact to the authorities are guilty of concealment of treason, which is punishable by fine and imprisonment. In general, treason consists in levying war upon the country or in adhering to the enemies, giving them aid and support. The punishment depends upon the occasion or circumstances under which the crime was committed, but it usually consists of imprisonment at hard labor for a long term of years. If committed at the time of a great conflict, the guilty party is usually punished by death.

TREASURE-TROVE (trězh'ůr-trov), the name applied to coin, bullion, or precious metals found hidden in the earth or any private place. the ownership of which is unknown. Objects of value thus found on land belonging to the finder, under the law of Rome, belonged to the person who discovered the treasure, but if the land belonged to some one else the objects found were divided equally between the finder and the owner of the premises. The common law of England vests the finder of such treasures in the crown, though this is not strictly enforced. In the United States the term treasure-trove is not used extensively. A treasure found belongs to the finder, unless the true owner is known, when the title is vested in him.

TREASURY (trězh'ůr-y), Department of. See United States, Departments of.

TREATY (tre'ty), a contract or agreement concluded by two or more nations or sovereigns. It is in the nature of a contract, and the parties to it rely upon the good faith of those concerned to carry out the matters stipulated. Treaties are usually made by commissioners duly appointed by the respective governments, and they are binding upon the nations concerned as soon as they are ratified by the sovereigns or the branch of government duly authorized to approve such agreements. In general the power to ratify is vested in the crown of a monarchy and in the chief executive and legislative branch of republics. The latter is the case in the United States. whose negotiations are conducted by commissioners and the power to ratify is vested in the President and the Senate. Treaties are known according to the purpose for which they are intended, as offensive and defensive, treaties of alliance, commercial treaties, and treaties of

TREBBIA (trěb'be-à). a river in the north-

ern part of Italy, anciently called *Trebia*. It rises 15 miles northeast of Genoa, in the Ligurian Appenines, and, after a course of 58 miles, joins the Po near Piacenza. The Trebbia is famous in history, owing to the defeat of the Romans under Sempronius by Hannibal in 218 B. C. The Austrians and Russians under Suvaroff defeated the French under Macdonald, in 1799, upon its banks.

TREBIZOND (treb'i-zond), a seaport city of Asiatic Turkey, on the southeastern coast of the Black Sea. It occupies a site surrounded by hills and is inclosed by substantial walls, on the outside of which are numerous suburbs. Trebizond is well paved and drained, but the architecture is inferior in most parts of the city. Several forts defend the city, and toward the interior are a number of well-established highways. The harbor is one of the finest on the Black Sea, thus giving the city excellent facilities to handle a large interior and export trade. Among the principal structures are a number of mosques, several hospitals and government buildings, and ten Greek churches. It has manufactures of fabrics, hardware, copper products, dyestuffs, and clothing, and is the center of a large export trade in wool, wax, oil, raw and manufactured silk, and tobacco products. The city was anciently known as Trapezus and flourished in the time of Xenophon. The Romans conquered it in the Mithridatian War. Trajan constructed extensive harbor improvements at this place. The Crusaders captured it in 1204, when it became the capital of the empire of Trebizond, which included a large region south of the Black Sea. It was in possession of Turkey from 1461 until 1916, when it was captured by the Russians. Population, 1915, 55,350.

TREE, Herbert Beerbohm, actor, born in London, England, Dec. 17, 1853; died July 2, 1917. He was the second son of Julius Beerbohm, a German resident of London, and was educated there and in Germany. In 1878 he made his first appearance as Grimaldi at the Globe Theater and for some time scored many successes. He won applause by playing in "The Private Secretary" at Prince's in 1884. Three years later he became manager of the Comedy Theater, and subsequently took charge of the management of His Majesty's Theater. He made successful tours of Canada and the United States, winning applause in numerous Shakespearian and other plays. He published "The Imaginative Faculty" and "Fallacies of the Modern Stage."

TREE FROG, or Tree Toad, a class of tailless batrachians that form the connection between the toads and the frogs. They live chiefly in trees, which they are able to climb by reason of their claw-shaped toes. The upper jaw and vomers have teeth. They are small, more active, and brighter colored than the true frogs, and utter loud, piping notes. Many species have been enumerated, but the larger number is found in the warmer regions. They differ widely in col-

ors, though the majority take on the hues of the trees they habitate.

TREFOIL (tre'foil), or Bird's-Foot, a genus of plants of the bean family. Many species are native to the temperate region of the Northern Hemisphere. The common trefoil has a stem from four to fifteen inches long, which usually is spreading and decumbent, and bears from four to ten yellow flowers. Some have associated this flower with the shamrock of Ireland. Several species are native and others have been introduced in Canada and the United States. These plants include a number which are of value as forage and are grown to some extent as fertilizing, being covered by plowing.

TREMOLITE (trem'o-lit), a species of hornblende. It consists chiefly of calcium and magnesia and has a white or grayish color. The forms are usually prismatic and crystalline.

TRENCH (trench), Richard Chenevix, clergyman and author, born in Dublin, Ireland, Sept. 9, 1807; died in London, England, March 28, 1886. He graduated from Cambridge in 1829 and, after traveling for several years, settled as clergyman in Hampshire. In 1835 he published "Story of Justin Martyr and Other Poems," a work of considerable merit, and in 1842 issued his "Poems from Eastern Sources." Among the most noteworthy of his publications not already named are "A Study of Words," "Gustavus Adolphus, with other Lectures on the Thirty Years' War," and "Sacred Latin Poetry."

TRENCH, an excavation in the earth, made during a siege, for the purpose of defense in an open field, or to protect the troops as they advance toward a besieged place. Trench warfare reached its greatest extent in France, both for offense and defence, in the great battles fought in the period from 1914 to 1918. An estimate made in 1917 placed the trench works between Switzerland and the North Sea, a battle line of 450 miles, at fully 12,000 miles, including the reënforced works at Verdun and Amiens.

TRENT, a river of Canada, in Ontario. It rises in Rice Lake and discharges into the Bay of Quinté, an inlet from Lake Ontario. The length is 150 miles and it affords good water power. It drains a basin of 4,000 square miles.

TRENT, a river of England, which rises in Staffordshire and 15 miles west of Hull joins the Ouse to form the Humber. The total length is 145 miles and it is navigable for barges about two-thirds of its course. In commercial enterprises it ranks of importance next to the Severn and the Thames. The Trent and Mersey Canal is one of several important artificial waterways of the system in which the Trent is a factor.

TRENT, or Trient, a city in western Austria, in the southern part of Tyrol, 48 miles north of Verona, Italy. It is located on the Adige River, has railroad facilities, and is surrounded by limestone hills. The Adige valley is remarkably fertile, containing fine farms, vineyards, and orchards. Trent is celebrated in history as the

seat of the Council of Trent, which met here in the pontificate of Paul III., in 1545, but was removed to Bologna the following year. It was dispersed in the latter year as a result of the Protestant rising in Germany, but was again convoked by Pope Julius III., in 1551, and was again dispersed by the Lutherans. Pius VI. called it into session in 1551 and four years later its labors were completed. The Council of Trent issued canons and decrees defining the doctrines of the Roman Catholic Church. They were reprinted innumerable times and have been translated into most modern languages. The city of Trent has considerable trade, numerous schools and churches, and is supplied with public parks, a library, and other municipal facilities. It was a free imperial city at the time of the former German Empire and in 1802 became a part of Austria. Population, 1918, 25,238.

TRENT, William Peterfield, author and literary critic, born in Richmond, Va., Nov. 10, 1862. He completed a course of instruction at the University of Virginia and subsequently at the Johns Hopkins University. In 1888 he was made professor of English in the University of the South at Sewanee, Tenn., where he worked efficiently until 1900, when he became professor of English literature in Columbia University. He founded the Sewanee Review in 1892 and was its editor about eight years. Besides contributing to periodical literature, he published a number of historical works and criticisms. Among his chief publications are "The Authority of Criticism," "English Culture in Virginia," "Southern Statesmen of the Old Régime," "Life of Robert E. Lee," "War and Civilization," and

"A History of American Literature."

TRENT AFFAIR, a complication arising between the United States and Great Britain at the beginning of the Civil War in America. The Confederate government sent J. M. Mason and John Slidell as commissioners to Great Britain and France respectively in 1861. They passed the blockade and embarked on the British merchant ship Trent, which sailed from Havana, Cuba. Captain Wilkes, of the United States ship San Jacinto, stopped the Trent near the Bahamas on Nov. 8, 1861, and seized Mason and Slideli as prisoners of war. The Northern States generally approved Wilkes's action, but it involved a violation of the international law and the two prisoners were surrendered to Great Britain because its neutral rights had been transgressed, thus preventing the war that country threatened.

TRENTON (tren'tun), the capital of New Jersey, county seat of Mercer County, 56 miles southwest of New York City. It is situated on the Delaware River, at the head of navigation, and on the Delaware and Raritan Canal, the Pennsylvania, the Baltimore and Ohio, the Philadelphia and Reading, and other railroads. An extensive system of electric railways furnishes communication to all parts of the city, and with it are connected trolley lines that penetrate many parts of New Jersey and the adjoining states.

The city is finely located on a pleasant site and the streets are well improved with stone, asphalt, and macadam pavements. The improvements include waterworks, sewerage, gas and electric lighting, and a system of public parks. Riverside Park and Cadwalader Park are fine public resorts. The spot where Washington placed his cannon at the Battle of Trenton is marked by a granite shaft surmounted by a bronze statue of Washington. A monument of George B. McClellan is situated in Riverview Cemetery. The State capitol is a fine structure of white marble. Other buildings include the county courthouse, the high school, the Masonic Temple, the State armory, and the post office. It is the seat of the State prison, the New Jersey Home for Girls, a State normal school, the State arsenal, and numerous hospitals and private institutions of learning. The public library contains about 50,000 volumes and in addition there are several other collections of books, including those of the State and the public schools.

Trenton has a large wholesale and jobbing trade. The manufacturing establishments represent a large capital. Among the enterprises are potteries, machine shops, brickyards, iron and brass foundries, and lumber yards. The general manufactures include clothing, rubber goods, bridges, cotton and woolen textiles, machinery, and malt liquors. It is the seat of the Jordan L. Mott iron works, the American Bridge Plant, the De Laval Steam Turbine Works, and the wire and cable factory of John A. Roebling's Sons Company.

The first settlement at Trenton was established in 1676, when it was generally known as The Falls. It received its name from William Trent in 1720, when the town was platted, and it was incorporated in 1746. Trenton was made the capital of the State in 1790 and two years later received its charter as a city. Population, 1905,

84,180; in 1910, 96,815.

TRENTON, a city in Missouri, county seat of Grundy County, on the Grand River, 102 miles northeast of Kansas City. It is on the Quincy, Omaha and Kansas City and the Chicago, Rock Island and Pacific railroads. place has a fine trade and is surrounded by a fertile farming and fruit-growing region. Extensive coal mines are worked in its vicinity. Among the principal buildings are the high school, the Jewett Public Library, and Ruskin The municipal facilities include sys-College. tems of waterworks and sanitary sewerage. Among the manufactures are lumber products, brooms tobacco, flour, and woolen goods. It has a growing trade in farm produce, coal, and merchandise. Trenton was settled in 1840 and incorporated in 1857. Population, 1910, 5,656.

TRENTON, Battle of, an engagement of the Revolutionary War, fought at Trenton, N. J., on Dec. 26, 1776. The British were sta-

tioned at Trenton, whence they had pursued Washington, who took a position on the other side of the Delaware River. The garrison consisted of 1,500 Hessians under Colonel Rahl, and Washington planned to cross the river and make the attack while they were engaged in their Christmas festivities. With a part of the American army, Washington crossed the Delaware while that stream was partly covered with floating ice, and at about eight o'clock in the morning surprised the garrison, which had not prepared for a resistance. The Americans lost only two killed and three wounded, while the British lost forty killed and wounded and about 1,000 prisoners. Washington recrossed the Delaware and occupied his former position. This victory and that at Princeton on Jan. 3, 1777, greatly revived the spirit of the Americans.

TRENTON SERIES, a group of rocks deposited during the Lower Silurian period, so named from Trenton, N. Y., where they were first studied. This series of rocks extends over large areas in the United States and the southern part of Canada. It is composed chiefly of limestone and in various places contains valuable minerals, such as natural gas and petroleum in Ohio and Indiana and lead and zinc ores in Iowa and Wisconsin. Outcroppings extend along the northern shores of Lake Ontario as far west as Georgian Bay. In thickness the series ranges from 100 to 2,000 feet, being thickest in Pennsylvania.

TREPANG (trê-păng'), or Beche de Mer, the name of a marine animal, the sea slug, commonly called sea cucumber. It is found along the eastern coast of Asia, in the West Indies, and the region east of Australia. The body is from eight inches to two feet in length. These animals are caught in large numbers and dried and are popular as food in China. Trepang is the name of the dried product, which is almost tasteless but highly nutritious. It is used chiefly in preparing soups.

TREPHINING (tre-fining), or Trepanning, an operation on the human skull, which consists of cutting an opening or making a perforation with the trephine, or trepan. The cutting edge of this instrument consists of a circular saw-toothed device about half an inch in diameter and is operated by means of a handle, similar to that of an auger. In case of fracture, especially where broken fragments of bone extend across the brain, this instrument is useful in cutting the attached end so it can be removed. Cerebral abscesses are often relieved by trephining, but the openings are made as small as possible, usually one-fourth of an inch, and if necessary are afterward enlarged by the chisel.

TRESPASS (tres'pas), in law, an offense committed against a person, the property, or the rights of another, such as an unlawful but peaceable entry upon the property of another. Mere words, without some action, do not constitute a trespass. A suit at law for damages

may be maintained in such a case and the intention of the trespasser is immaterial, since the law takes into account the damages and not the intention. A person who aids or incites the perpetration of a trespass is liable as well as the direct perpetrator, and the principal who has given authority to an agent may be liable for trespass committed by the latter. A peaceable entry into a house or upon the land of another, with intention to take possession and oust the true owner, is regarded as a trespass. One who enters the house of another without permission, or walks over his ground, or suffers cattle and other live stock to stray upon it, commits the offense of trespass, and the owner has the right to an action for damages. In cases where a municipality or county places a restraint upon cattle and other live stock running upon the streets and highways, the owner of such stock is guilty of trespass if he permits it to run at large. In such a case he is subject to a fine and, if such stock enters upon private property, he may be held liable for damages.

TREVELYAN (trê-vil'yan), Sir George Otto, author and statesman, born at Rothley Temple, England, July 20, 1838. He was the only son of Sir Charles Edward Trevelyan (1807-1886), studied at Cambridge University, and in 1865 became a member of Parliament, where he was a loyal supporter of Gladstone. In 1880 he became Secretary of the Admiralty and in 1885 was made Secretary of Scotland. His writings include "Life and Letters of Lord Macaulay," "The American Revolution," "The Competition Wallah," and "Early History of Charles James Fox."

TRIANGLE (trī'ăn-g'l), in geometry, a figure bounded by three straight lines, the most simple of geometrical figures. The side upon which it rests is called the base; the point of the angle opposite the base is the vortex; and the lines extending from the base to form the vortex are termed the sides. The angles of the triangle are the angles formed by the sides with each other. Triangles are classed according to the relative length of their sides-into equilateral, or equal-sided; isosceles, or with two sides equal; and scalene, or unequal-sided. A triangle is right-angled if one of its angles is a right angle. It is obtuse-angled when one of its angles is greater than a right angle, and it is an acute angle when it has no angle so great as a right angle. If all the sides are straight lines, it is termed a plane, or rectilinear, triangle. A triangle whose three lines are curved is said to be curvilinear. A spherical triangle is one whose sides are arcs of great circles of the sphere. To find the area of a spherical triangle, it is necessary to multiply the spherical excess by the square of the radius of the sphere; the spherical excess is found by subtracting 180° from the sum of the three angles.

TRIANON (trê-ā-nôn'), or Grand Trianon, the name of a villa built by Louis XIV. in Ver-

sailles, France. This structure was completed in 1685 as a residence for Madame Maintenon and is a handsome building of one story. It was the scene of the trial of Marshal Bazaine in 1873. Another building, known as the Petit Trianon, was built for Madame du Barry by Louis XV. in 1776. Near it are several Swiss cottages and a lake. Marie Antoinette resided here for some time.

TRIASSIC SYSTEM (tri-ăs'sĭk), a group of rocks belonging to the Mesozoic period, immediately following the Permian and preceding the Jurassic systems. The name originated from the fact that the formations in Germany are grouped in three series, including the local divisions of Buntersandstein, or spotted sandstone; Muschelkalk, or mussel chalk; and Keuper marls, or copper marls. More recently the Rhaetic clays and sandstones overlying those mentioned have been added. The rocks of the Triassic System are widely distributed in Europe and Asia, but are less clearly marked in Australia and Africa. They are represented extensively in Canada and the United States and are particularly abundant along the Hudson River, where they make up a large part of the Palisades. In the region of the Pacific coast, both in Canada and the United States, they reach a maximum thickness of nearly 5,000 feet. Many fossils are found in this formation, including ferns, conifers, fishes, and gigantic reptiles, such as the dinosaurs and plesiosaurs.

TRIBE, the term applied to a subdivision of

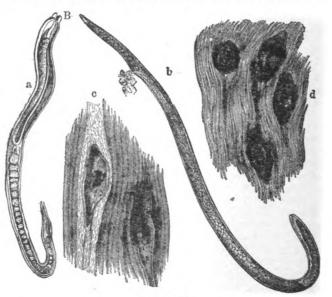
a nation or stock that has not been organized as a civil state. The principal divisions of the Roman people were known as tribes. In general, the development of a nation begins with the clan, passes through the tribal state, and finally merges into the larger and more completely organized body known as the nation. Romulus divided the Romans into the three tribes known as the Ramnenses, the Titienses, and the Luceres, who probably represented the Latin, the Sabine, and the Etruscan elements, respectively. Each of these tribes was subdivided into ten curiae, and these were required to furnish a given proportion of the military forces for general defense and offense. The ancient people of Greece are frequently mentioned as divided into tribes, which appear to have developed from various clans, and later from territorial or political divisions. Since the Greeks were a nation of different races, the tribes frequently

constituted classes distinguished by rights. Anciently the term tribe was used extensively in reference to the Teutonic peoples, and dif-

ferent divisions of them are mentioned in history as the Germanic tribes. In American history we have characteristic examples of tribal organization. For instance, the Seneca tribe was constituted of eight totem kins. Historians usually term the five tribes of the Iroquois as the Five Nations and refer to any federation of clans under the general term of tribe.

TRIBUNE (trib'un), an officer of the ancient Romans, whose duty was to preside over a tribe for the purpose of administration, or to represent it in some official capacity. Originally a tribune represented or stood at the head of each of the three patrician tribes, the Ramnenses, the Titienses, and the Luceres, which originally included the entire body of Roman citizens. Later the term came to have a wider signification. The plebeian tribunes defended their order against the patrician magistrates, and subsequently from three to six military tribunes with consular powers were elected annually. Another class of officers were the military tribunes. who were above the centurions and directly under the commander in chief. Each legion had six such tribunes. During the time of the kingdom they were appointed by the king, but the consuls exercised this power in the republic. During the later portion of the republic they were elected by the people in the assembly of the tribes.

TRICHINA (trǐ-kī'nà), a minute spiral flesh worm discovered in 1835 by Sir James Paget. It is parasitic in the sexually matured



TRICHINAE.

a, Male trichina; b, Female trichina: B. Heads of the worms; c, d, Trichinae in the flesh. stage in the small intestine and in the larval

stage in the voluntary muscles of man, swine,

and other mammals. The worm in the larval

stage measures about one-seventy-eighth of an inch in length and one-two-hundredths in breadth. It is scarcely visible to the naked eye. In the mature stage the male is about oneeighteenth and the female one-eighth of an inch long. The female produces large numbers of embryos in the small intestine, whence they bore their way through the intestinal wall and pass into the muscles of the body, where they surround themselves by a cyst, which afterward becomes calcareous. The larva may remain encysted for ten or more years and undergoes further development only when the infected flesh is eaten by a suitable host, when the sexually mature stage is attained in the alimentary canal. Trichinae can enter the human system only by insufficiently cooked flesh, and, being swallowed alive, they soon develop to maturity and multiply in great numbers. Persons infected in this manner have swellings of the face and limbs, which are accompanied by a fever, and death results if aggravated cases are not treated promptly. The flesh of swine is the most prolific source of infection to man. Other animals frequently infected include rats, dogs, rabbits, mice, badgers, and moles.

TRICHINIASIS (trik-i-ni'à-sis), or Trichinosis, the disease caused by the presence of trichinae in the muscles and intestinal canal. In mankind it is due chiefly to eating the flesh of swine in which these small worms are found. They become liberated soon after the meat is swallowed and multiply very rapidly. Among the symptoms are fever, muscular pains, and others that resemble those common to typhoid fever. Since great danger attends the affliction, a physician should be consulted immediately, else death may result. Castor oil or calomel are prescribed in the early stage to expel the embryos from the stomach and intestines. Frequently the disease appears as an epidemic. It sometimes merges into acute fever, rheumatism,

or pneumonia.

TRICOLOR (trī'kŭl-ēr), the national banner of France, which consists of blue, white, and red colors running in a direction parallel to the flagstaff. The sections are equal in size and the colors are arranged in the order named, the blue being next the staff. Sometimes the name is applied to the national banner of Germany, which is that of the ancient empire, being black,

red, and gold.

TRICYCLE (trī'sĭ-k'l), a velocipede with three wheels, introduced for general use in 1876. Many varieties of this vehicle have been placed on the market, but it has not proved a success, except for use by children as a toy and for invalids and others who are unable to walk. In most tricycles the power is applied by the feet through a crank axle, which is connected by a chain with the driving axle. In most designs the rider sits near the two hind wheels, which are worked by the driving axle, and a smaller front wheel is provided to maintain position.

TRIER (trer), or Treves, a city of Germany, in the Rhine province of Prussia, on the Moselle River, 68 miles southwest of Coblenz. It has extensive steam railroads and electric railway facilities. The surrounding country contains extensive gardens, vineyards, and tracts of woods. The Porta Nigra, a fortified gate with lofty towers, is an ancient Roman relic. Among the principal buildings are the cathedral, the municipal library of 125,000 volumes, the city hall, and the Gothic Church known as the Liebfrauenkirche. It has a beautiful public square, near which are the ruins of a Roman palace. The library contains the illuminated Codex Egberti and a copy of the Gutenberg Bible, which was published in 1450. Trier is a commercial and manufacturing center of considerable importance. Among the chief products are musical instruments, glass, furniture, leather, soap, ironware, and machinery. It has a large trade in fruit and grain. Lead, tin, and copper mines are worked in the vicinity.

Trier is considered one of the oldest cities of Germany. Anciently it was called Augusta Trevirorun, when it was a Roman colony. In the 5th century it was captured by the French, but was permanently united with Germany in the following century. The Congress of Vienna made it a part of Prussia in 1815. Population.

1915, 46,709.

TRIEST (trė-est'), or Trieste, a seaport city of Austria-Hungary, on the Gulf of Triest, an inlet from the Adriatic Sea, 70 miles northeast of Venice. The city has a fine harbor and ample railroad facilities. It is the center of a large interior and foreign trade. Among the principal buildings is an ancient cathedral in the Byzantine style. Others of note include the municipal buildings, the museum of antiquities, the Cathedral of San Guiesto, the public library, the Capuchin convent, and the university. streets of the newer part of the city are broad and handsome, but some of the older streets are narrow and poorly paved. It has gas and electric lighting, street railways, waterworks, public parks, and municipal baths. Among the leading manufactures are leather, white lead, ships, soap, cordage, cotton and woolen goods, clothing, and machinery. It has a large trade in wine, fruit, grain, coal, tobacco, and merchan-dise. The offices of the Austrian Lloyd's shipping company are the most extensive establishments of the kind in Europe. Tergeste was the ancient name and in the time of the Romans the city rose to commercial importance. It has belonged to Austria since 1832. A large proportion of the people are Germans, but the inhabitants include numerous Greeks, Jews, Italians, and Dalmatians. Population, 1910, 229,475.

TRIGONOMETRY (trig-ō-nŏm'ē-try), the science which treats of the relations between the six parts of a plane triangle, these being the three sides and the three angles, so that when three of these parts are known the other three

2920

may be computed. Although geometry treats of this subject, the geometrical methods are purely graphical and cannot be used to obtain accurate numerical results. In nearly all applications of trigonometry the practical object is to measure indirectly some height or some distance of which the direct measurement would be inconvenient or impossible. The principles of trigonometry are employed very extensively by the astronomer and the civil engineer, hence most treatises on the subject include a consideration of navigation, surveying, and spherical astronomy. Trigonometry is divided into plane trigonometry, spherical trigonometry, and analytical trigonometry. Plane trigonometry treats of plane angles; spherical trigonometry, of spherical triangles; and analytical trigonometry, of trigonometric functions.

TRINIDAD (trĭn-ĭ-dăd'), a city in Colorado, county seat of Las Animas County, on the Las Animas River, ninety miles south of Pueblo. Communication is furnished by the Colorado and Southern, the Denver and Rio Grande, and the Atchison, Topeka and Santa Fé railroads. It is surrounded by a farming and grazing country, which contains large deposits of bituminous coal. Its principal buildings include the county courthouse, the high school, the public library, the Saint Raphael's Hospital, and the Saint Joseph's Academy. Among the industries are coking ovens, brickyards, and railroad machine shops. It has public waterworks, sanitary sewerage, and a large trade in coal and merchan-Population, 1900, 5,345; in 1910, 10,204,

TRINIDAD, an island off the northern coast of South America, forming with Tobago a possession of Great Britain. Trinidad is separated from Venezuela by the Gulf of Paria and is the most southern of the Windward Islands. It is 54 miles long and 40 miles wide. The area is 1,754 square miles. Tobago is situated northeast of Trinidad. The climate is healthful, especially in the more elevated regions. The soil is mostly fertile, though in the northern part of Trinidad are a number of mountain groups. Fine forests prevail in both the islands. Among the chief productions are sugar, molasses, rum, timber, tobacco, pitch, coffee, cotton, and many varieties of fruits. Fish and aquatic birds are abundant. Horses, cattle, sheep, and poultry are reared. A lake of Trinidad is remarkable for its extensive supply of pitch, the annual product of asphalt The Cafrom this lake being about 190,000 tons. roni River is the principal stream of Trinidad. Port of Spain is the chief town and capital. The colony has about 100 miles of railroads, 1,000 miles of telegraph lines, and about 800 miles of telephones. It has annual exports valued at \$10,-100,000 and imports estimated at \$11,125,000. The island was discovered by Columbus, in 1498, and Trinidad was so named because he saw from the masts of his ship three mountain summits. It became a British possession in 1783. Population, 1916, 341,418.

TRINITY (trĭn'i-tỹ), a river of Texas, formed near Dallas by two forks, known as the East Fork and the West Fork, which rise in the northern part of the State. It has a general course toward the southeast and flows into Galveston Bay, 40 miles north of the city of Galveston. The total length is 550 miles. It is navigable for large boats to Liberty, about 22 miles, and for small craft for 300 miles. The Trinity flows through a fertile section of country.

TRINITY, Doctrine of the, the Christian doctrine that three persons constitute the divine nature, the Father, the Son, and the Holy

Ghost. See God.

TRINITY SUNDAY, the eighth Sunday after Easter, immediately following Whitsunday. It is celebrated as a festival in honor of the Trinity, hence the name. Pope John XXII. established the festival in 1320 and it is celebrated as such by both the Rôman Catholic and the Protestant churches, but not by the Greek Church. All the Sundays between Trinity and Advent are termed Sundays after Trinity, while most of the festivals occur in the half year between Advent Sunday and Trinity. No such festival as Trinity Sunday was known to the early Christians.

TRIO (trī'o), in music, a composition for three voices or instruments, one of the parts of which must make the third with the bass and the other with the fifth octave. The name piano trio is applied to a composition written for the piano, 'cello, and violin, and the term string trio has reference to one written for the violin, viola, and 'cello, or two violins and a 'cello. In a minuet the term trio signifies the passage, formerly called the menuetto, which alternates with

the minuet proper.

TRIPLE ALLIANCE, the name applied to several treaties of European nations. Among these may be mentioned the league formed in 1668 by Sweden, England, and the Netherlands as a means of protecting the Spanish Netherlands against Louis XIV. of France. A triple alliance was concluded by England, France, and the Netherlands in 1717 against Spain and the Pretenders. The Dreibund, a league of Germany, Austria, and Italy, was formed in 1882 as a successor to the Dual Alliance between Austria and Germany. It had for its purpose mutual protection in case of attack by other powers.

TRIPLER, Charles E., scientist, born in New York City, in August, 1849. He studied in the public schools, where he developed an early aptitude for the sciences. Subsequently he gave much attention to the study of gases and for many years conducted special experiments at his private laboratory in New York City. His most noted discoveries and inventions relate to liquid air (q. v.). Many of his devices are in successful use. He organized a company with a capital of \$10,000,000 to practically apply his discoveries, but in 1901 a decision of the United States patent office gave Carl Linde, of Munich, Germany,

TRITON

prior rights to the invention of the self-intensifying process of making liquid air. His claims were based on patents issued in 1897, while Linde's patent was issued two years earlier.

TRIPOLI (trip'o-li), or Tarabulus, a seaport of Asiatic Turkey, on the eastern shore of the Mediterranean, 45 miles northeast of Beyrout and 70 miles northwest of Damascus. It is situated in a fertile plain of Syria and most of the structures are of stone. The chief buildings include several mosques, a hospital, and a number of schools. It has a large export trade in silk, oil, cereals, sponges, and tobacco. Off the coast are valuable fisheries of sponges. Tripoli was known as Tripolis in ancient times. In its vicinity are ruins dating from the time of the

Crusaders. Population, 1917, 31,500.

TRIPOLI, a seaport city of North Africa, capital of the vilayet of Tripoli, almost due south of the Island of Sicily. It occupies a rocky prominence projecting into the Mediterranean. Surrounding it are fine orchards of lemons, oranges, apricots, and other fruits. The city is defended by high walls and several fortresses. It contains numerous synagogues, mosques, churches, and several government buildings. The manufactures include carpets, leather, silk and woolen textiles, jewelry, and utensils. Numerous caravans start at Tripoli, penetrating through the Sahara and Soudan as far as Timbuctoo, Lake Tchad and Bornu. Most of the business interests are in the hands of Jews and Christians, though a majority of the people are Arabic and Turkish Mohammedans. Tripoli has a triumphal arch erected in 164 A. D. in honor of Marcus Aurelius. Population, 1918,

TRIPOLI, a country of North Africa, lying south of the Mediterranean Sea, between Tunis and Egypt, and extending into the Sahara The coast line is 900 miles long, and Desert the principal indentation is the Gulf of Sidra. Tripoli is a vilayet, or province, of Turkey. It is divided into the four governments of Fezzan, Khoms, Barca (the mutessarriflik of Bengazi), and Jabel-el-Sharb, with a total area of 410,000 square miles. The coast region is the most fertile, especially a belt about twenty miles Parallel to the coast are ranges of the Atlas Mountains, which reach a height of 2,500 to 4,025 feet above sea level, thus preventing copious rains in the interior, which is largely arid. The southern part is a vast desert tract in which rain seldom falls, vegetation depending wholly upon heavy dews that prevail.

Agriculture and stock raising are the principal industries. The productions in the coast region include cotton, wine, grain, grasses, ostrich feathers, and many varieties of tropical Those of the interior embrace ivory, skins, and various minerals. It has considerable interests in fruit culture. Off the coast are productive fisheries of sponges, pearls, sturgeon, and haddock. Sheep and cattle are reared in large numbers on the interior grazing land, and horses of excellent quality are grown by Bedouin herders. The culture of silk and the mulberry tree engages many people. The principal exports include grain, fruit, and live stock, and the leading imports embrace wines, tea, and manufactured articles.

The government of Tripoli is administered under a governor general, who receives his appointment from the Sultan of Turkey. It may be classed as a despotic government, although it has had a form of constitution since 1909. The people pay as tribute a tenth of all the products of the soil, though there is a special tax on cattle, camels, sheep, and olive trees. However, formerly the revenues were derived principally from prizes captured by the corsairs and the ransoms secured for captives. Anciently Tripoli belonged to Cyrenaica and it still has some ruins at Cyrene, Leptis, and Ptolemais which date from the time of ancient prosperity. Subsequently the Carthaginians came in possession of the country and later it was occupied by the Romans. It became Mohammedan under the Arabs after the decline of Rome. In 1552 it became a possession of Turkey, but was annexed by proclamation to Italy in 1911. Tripoli is the capital and largest city. Cyrene, Derna, and Benghazi are trade centers. Population, 1912, 785,450.

TRIPOLITE (trip'o-lit), or Tripoli, the name of an earthy substance, arising from the decay of schists and impure limestone, so called from being procured originally from Tripoli in Africa. It consists almost entirely of silica and is composed largely of the mineral remains of infusoria. The color is white or vellowish-gray and it is granular but not compact. This product is widely distributed, but is procured chiefly from Missouri, France, and Germany. It is used in polishing and in building water filters.

TRIREME (trī'rēm), a vessel or galley used by the ancients, especially the Greeks, Carthaginians, and Romans. It was the largest vessel employed, containing three benches of oars on each side and carrying large square sails to be raised in a fair wind, though sails were not employed while the vessel was in action. A trierarch commanded the vessel, which was often manned by 200 men, who were able to move it with considerable swiftness. In engagements it was made an object to run up suddenly against the vessels of the enemy to disable a large number of oars, or to crush in. one of the sides. Where two vessels were unequally equipped, the stronger made it an object to sail alongside the opponent and overcome the crew by personal contact. In later years galleys with five benches of oars took the place of the trireme.

TRITON (trī'tŏn), in Greek mythology, the only son of Poseidon, who is described as one of the minor sea gods. He was represented as an attendant of his father, usually mounted on a sea monster, and holding in his hand a conch-shell trumpet, with which he soothed the



TRITON.

turbulent waves. His home was in the golden palace of his father beneath the Aegean Sea, and he found favorite pastime in riding over the billows of the deep. The Tritons, a class of sea gods, were the offspring of Triton.

TRITON, a genus of water salamanders, which are widely distributed in temperate and subtropical regions. They are found in large numbers, both as water and land animals, in the warmer sections of North America. The front feet have four toes and the hind feet have five, and the body is covered with warty tubercles. The spotted triton is a familiar species in the Atlantic states. It is about five inches long, has a brownish-green color, and is more or less spotted with various markings. It is a water animal, but can live on the land for a short period. The feet serve to creep on land and to balance itself while submerged, the forward movement in water being effected by means of the tail. It occurs from New Brunswick to Georgia, and is a favorite and interesting animal for the fresh-water aquarium. The water newt, or crested triton, of Western Europe is somewhat larger, being nearly seven inches long, but is closely allied. The great triton, or conch, belongs to this order of animals. It is a gasteropod mollusk of the Murex family. Its shell is used by Australian and Polynesian natives as a trumpet. About 100 more or less closely allied species of tritons are now living. Fully 45 fossil species have been described.

TRIUMPH (trī'ŭmf), the name of a solemn procession in ancient Rome, constituting the highest public honor bestowed upon a commander who achieved great successes in warfare. The pageant was led by the senate and the spoils and prisoners, after which came the victorious general or naval commander in a vehicle drawn by four horses, and the rear was brought up by the army of the victor. The procession extended along the Sacred Way to the Temple of Capitoline Jove, where sacrifices were solemnly offered to Jupiter. A naval triumph was usually smaller than one celebrated for a military commander and the festivities were characterized by nautical trophies. The triumph was concluded by an extended season of banquets and entertainments. It was customary to bring captives, especially hostile chiefs, to the pageant, and they were usually put to death during the triumphal march. The last triumph was celebrated in 302 A. D. by Diocletian.

TRIUMVIRATE (tri-um'vi-rat), a Latin word meaning composed of three, applied among the Romans to an office filled by three men. Officials belonging to the triumvirate were called triumvirs, and their duties were to jointly execute the obligations incumbent upon public officers. The two great coalitions formed of the three most powerful individuals in the Roman Empire included the triumvirate of Julius Caesar, Crassus, and Pompey, in 60 B. C., and that of Octavius, Antony, and Lepidus, in 43 B. C. The former was never formally recognized. It was broken by the defeat of Crassus in Mesopotamia and the Civil War soon after caused the death of Pompey, resulting in the succession of Julius Caesar as perpetual dictator. The triumvirate formed in 43 B. C., though usually called the second, was in reality the first to receive official recognition. Under it the empire was divided, Lepidus receiving Italy, Octavius the West, and Antony the East. In 1849 Saffi, Mazzini, and Armellini formed a triumvirate at Rome, assuming entire executive

TROGLODYTE (trŏg'lò-dīt), the name given to a race of cave dwellers in ancient Greece, and later the term was applied similarly in other countries. These people were uncivilized and their dwellings were constructed in natural caverns or in caves dug in bluffs or hillsides. Strabo mentions people of this class in connection with the history of the Caucasus and the southern part of Egypt. It is asserted that they did not possess the art of speech, but uttered shrieks and screams similar to those of the lower animals. They were pastoral, practiced polygamy, and put the aged and infirm to death.

TROGON (trō'gŏn), a genus of birds found in the warmer climates of both hemispheres. The bill is short and strong, the wings are moderate and rounded, and the legs and feet are rather weak. These birds have a richly colored plumage, usually metallic green above and red below, and some species have remarkably long tails. Of the fifty species enumerated, more than half are found in America. They subsist largely on fruits, berries, and insects and build their nests in the cavity of decayed trees. The voice is loud and unpleasant and some utter clucking and whistling notes. See illustration on following page.

TROJAN WAR (tro'jan). See Troy; Homer.

TROLLING (trōl'ling), a favorite method of angling to catch various kinds of fish. The lure is in the form of a spoon bait and is so attached to a line that it spins as it is drawn through the water, which is made possible by the use of a swivel. The bluefish and several other fish are taken from a boat in motion, and some species are caught by throwing the lines so as to be carried by the current of tides or the flowing water in streams. Among the fish

2923

caught successfully by trolling are the pickerel, mackerel, tarpon, tuna, bass, and bluefish.

TROLLOPE (trŏl'lup), Anthony, novelist, born in London, England, April 24, 1815; died Dec. 6, 1882. He was a son of Frances M.



leys." He assisted in establishing the Fortnightly Review in 1865 and subsequent to 1867 served as editor of the Saint Paul Magazine. Among his most noteworthy writings are "Life of Cicero," "West Indies and the Spanish Main," "The Bertrams," "Castle Richmond," "Golden Lion of Granpère," "Way We Live Now," "Ralph the Heir," "Marion Fay," "Framley Parsonage," "Last Chronicles of Barset," "North America," "Phineas Finn, the Irish Member," and "Traveling Sketches."

TROLLS, the name applied in Scandinavian mythology to various supernatural beings. It sometimes refers to misshapen dwarfs and in other cases to giants. Trolls were looked upon as powerful and hostile to man, but were considered very stupid. Their stupidity made it possible to defeat them without difficulty, but great danger attended those who fell into their hands.

TROMBONE (trŏm'bōn), a large instrument of the trumpet kind, having a deep and loud tone. It is one of the wind instruments possessing a complete chromatic scale, like the human voice or violin, and is considered a very valuable addition to the orchestra. The form generally used has a long tube bent twice upon itself and fitted at the outer bend with a U-shaped slide, by the motion of which the length of the vibrating air column may be adjusted so as to form any note within its compass. Three kinds of trombones are in general use, called after their pitch the alto, tenor, and bass trombones. Some instruments are fitted with pistons, when they are known as valve trombones.

TROMP (tromp), Martin Harpertzoon van, famous admiral, born at Brielle, Holland, in 1597; slain July 31, 1653. His father was a commander in the navy of Holland. The son went with his father to the East Indies in a merchantman in 1605, where both were captured and held as prisoners by the English for several years. He escaped to Holland, joined the navy in 1624, and soon after became lieutenant admiral. In 1639 he surprised and completely destroyed a Spanish fleet near Gravelines, off the coast of Holland, and was soon after made admiral. He was defeated by an English fleet under Admiral Blake on May 19, 1652, but on Nov. 29 of the same year he defeated the latter in the Strait of Dover, and sailed up the channel without meeting material resistance. In 1653 another battle occurred, which lasted three days without decisive results, but Tromp was defeated with a loss of seventeen vessels in June of the same year. On July 31, 1653, a decisive battle occurred off the coast of Holland, in which the Dutch lost thirty vessels and Admiral Tromp was killed by a musket bullet. His son, Cornelius Tromp (1629-1691), was a famous admiral of Holland. He and De Ruyter defeated the English fleet in 1666. Later he demonstrated remarkable ability in commanding against the allied fleet of France and England. Charles II. of England made him a baron in 1675, and he was subsequently lieutenant admiral of the United Provinces

TRONDHJEM (tron'yem), a city of Norway, at the mouth of the Nid River, 240 miles north of Christiania. It is situated on the south shore of Trondhjem Fjord, which is open for navigation the entire year, and has railroad facilities to points in Norway and Sweden. The streets are well improved and regularly platted. It has systems of waterworks, sewerage, and electric lighting. The chief buildings include the public library, the Lutheran Cathedral, and several institutions of learning. The public library has 110,000 volumes and with it is connected a museum of natural history. Among

2924

TROPHY

the manufactures are paper, sugar, machinery, snuff and cigars, canned and cured fish, and sailing vessels. It has a large export trade in timber, minerals, and fish. The city was founded in 996 and was long known as Nidaros. Population, 1910, 45,228.

TROPHY (tro'fy), a memorial erected on a field of battle to commemorate the deeds of valor of the victorious party. Trophies were erected by the Greeks and Romans. They consisted largely of the arms of slain enemies, placed either upon a stone or metal pillar. The Romans, to make their trophies inviolable, consecrated them to Jupiter or some other deity. Trophies were allowed to perish by natural causes, since it was desired that hostile feelings should not be perpetuated, and any attempt to repair them when decayed was regarded as sacrilegious. Trophies have been erected in many modern churches and other buildings. These are usually carved in stone or bronze, are placed upon the walls, and commemorate heroism and valued service.

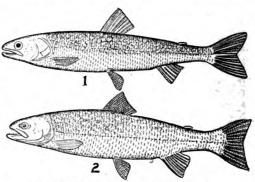
TROPIC BIRD, a class of sea birds of the pelican family, having webbed feet, two elongated tail feathers, and a strong bill. They are able to fly with considerable facility and are seen quite frequently on the wing, being birds of powerful flight. Two well-known species are common to the Atlantic, Indian, and Pacific oceans. The common tropic bird is about thirty inches long, with an alar extent of forty inches. In size it resembles the partridge. The color is white with black markings on the head, back, and wings. These birds breed on high cliffs and are hunted by natives for their flesh and ornamental feathers. A species common to the tropical Pacific is bright red. The long tail feathers are used by the natives for ornaments.

TROPICS (trop'iks), two small circles imagined drawn parallel to the Equator, situated about 23° 27' north and south of it. They serve to indicate the region at which the sun is seen in the zenith on the days of its greatest declination, and between them are included all the points on which the sun's rays fall vertically at any season of the year. The tropic north of the Equator is called the Tropic of Cancer, since the sun is in the constellation of Cancer when shining directly upon it, and the one south of the Equator is called the Tropic of Capricorn, because the sun, when shining directly upon it, is in the constellation of Capricorn. Between the two tropics lies the Torrid, or Hot, Zone, the climate of which is said to be tropical. The width of the Torrid Zone is and north and south of it are the North and South Temperate zones, respectively. Animals and plants are larger and include more species than in any other zone, birds are more numerous and of gayer plumage, and the sea shells are brighter than in lands where the sun shines with less power.

TROUBADOUR (troo'ba-door), the name

given to a class of poets which appeared in Provence, in the south of France, near the close of the 11th century, but later spread to Spain and Italy. They engaged in the production of lyrical poetry, chiefly of the kind complicated in meter and rhymes, and devoted themselves to the musical art rather for the love of it than to secure monetary profit. The art of the troubadours came to be called the gay science. It is supposed to have been brought from the East by the Spaniards, of whom the French of Provence learned it and afterward gave it higher development. They became popular at the courts of kings and nobles, whose deeds they praised or censured in songs, though they more frequently sang of fancy and love on subjects selected by some lady. In many cases the poems were devoted to the evils of the times, subjects of gallantry, conditions of society, and skill in military arts. The period in which they flourished was from 1085 until 1290, about 200

TROUT, the name of many species of fish belonging to the salmon family, abundant in almost all the rivers and lakes of the tem-



1. Speckled Trout: 2. Dolly Varden Trout.

perate and colder zones. They are excellent food fishes, but differ from the salmon proper in that they frequent only bodies of fresh water. The brook, or speckled, trout is common to the Northern States and Canada and is one of the favorite food fishes. It weighs one to two pounds, is six to twenty-six inches long, and has a brown or yellowish color with spots of red and black. Other American species include the lake trout, mountain trout, Dolly Varden trout, blue-black trout, golden trout, salmon trout, and Mackinaw trout. Several American species have been introduced to Europe, and the common river trout of Europe has been successfully planted in Canada and the United States. Trout fishing is a favorite sport, since they are very voracious and readily take any kind of animal bait, especially worms and flies. The color of the trout varies somewhat according to the condition of the water and the flesh ranges from white to pink, the latter being most highly prized. Several species attain a large

size. Specimens weighing from 25 to 40 pounds are not rare.

TROUVERE (troo-vâr'), the name given to a class of ancient poets in France, corresponding to the Provençal troubadour. They composed a large part of the courtly lyrics of medieval France. The trouvères are distinct from the *jongleurs*, who were the class that performed the works composed by the trouvères, but some of the jongleurs aspired to composition. Most of the trouvères were men of rank and standing, such as priests or knights, and their compositions were largely epic or narrative in character.

TROWBRIDGE (trō'brij), John Townsend, novelist, born in Ogden, N. Y., Sept. 18, 1827. He attended the public schools and fitted himself for public school teaching, but in 1846 removed to New York and engaged in magazine and newspaper writing. In 1850 he became

imposing site in the northwestern part of Asia Minor, near the Aegean Sea and the western extremity of the Hellespont. We learn from the *Iliad* that the city was situated at the foot of Mount Ida and that between it and the sea was the plain of Troy, a stretch of land about nine miles wide. It is believed that the plain referred to is a scope of land lying near the mouth of the Mendereh River, now supposed to be the Scamander of Homer. Schliemann made excavations in this vicinity and discovered remains of a prehistoric city, believed to be ruins dating from the ancient Troy.

Homer relates that Troy reached its greatest splendor in the reign of King Priam, but its destruction was caused by Paris, a son of Priam, abducting Helen, wife of Menelaus, King of Sparta, and carrying her to the Trojan capital. The Greeks spent ten years in collecting an army to avenge this outrage, and, under the



MENELAUS.

PARIS. DIOMEDES.

ULYSSES. NESTOR. ACHILLES. AGAMEMNON.

editor of *The Yankee Nation* and was assistant editor of *Our Young Folks* from 1870 to 1873. His published works are very numerous and many of his stories have been immensely popular owing to their interesting style. His first novels were written under the pseudonym of *Paul Creyton*. Among his writings are "Hearts and Faces," "Old Battle Ground," "Three Scouts," "Story of Columbus," "Bound in Honor," "His Own Master," "Scarlet Tanager," "Coupon Bonds," "The Vagabonds, and Other Poems," "Silver Medal Series," "Lawrence's Adventures Among the Ice-Cutters," "Biding His Time," "The Lottery Ticket," and "Cudjo's Cave." The last mentioned had the most extensive sale of any of his books. He contributed to the *Atlantic Monthly* for several years. He died Feb. 12, 1916.

TROY, or Ilium, a famous city of Asia Minor. It is celebrated as the seat of the Trojan War, the chief events of which are recounted in the *Iliad*, written by Homer. The ancient city is supposed to have occupied an

leadership of Agamemnon, who had 1,186 ships and 100,000 men, drove the Trojans within the walls of Troy, where they conducted a siege for ten years. A quarrel between Achilles and Agamemnon proved disastrous to the Greeks in the beginning of the tenth year, and this is the special subject of the *Iliad*.

It is related that the Greeks were unable to capture the city by direct assault. Hence, they constructed a huge wooden horse, within which they concealed a band of the bravest Greek heroes. The Greeks left this structure before the gates of Troy, withdrew from the city, and the army and navy sailed to an island near the coast called Tenedos. Much rejoicing was occasioned in the city at the departure of the Greeks, and it was proposed that the wooden horse be drawn within the walls. However, Laocoön warned the Trojans not to bring any device made by the Greeks into the city and while speaking cast his spear against the wooden horse. Soon a monstrous serpent rose from the sea and devoured Laocoon and his sons,

thus leading the people to believe that destruction had visited his home because he had cast his spear against an object sacred to Minerva. They accordingly brought the horse within the gates by means of ropes and rollers, but at night a secret door was opened and the brave band of Greeks concealed within, aided by the Greek army, returned from the island, captured and destroyed the city. It is thought that this event occurred in 1184 B. C. Among the bravest Grecians who took part in the memorable siege were Achilles, Agamemnon, Ajax, Ulysses, Menelaus, Diomedes, Nestor, and Patroclus. The celebrated Trojans included Hector, Sarpedon, and Aeneas. It is supposed that Aeolic Greeks founded a city on the site of Troy in 700 B. C., known as Ilium, though this, as well as the Homeric account of the fall of Troy, is doubtful.

TROY, a city of Alabama, county seat of Pike County, 52 miles southeast of Montgomery. It is on the Central of Georgia and the Plant System railroads and has a large shipping trade in cotton and produce. The public utilities include waterworks and electric lighting. Among the noteworthy buildings are the county courthouse, the high school, and the State normal school. It has manufactures of earthenware, tobacco products, and machinery. The first settlement on its site was made in 1843, in which year it was incorporated. Population, 1910, 4,961.

TROY, a city of New York, county seat of Rensselaer County, on the Hudson River, six miles north of Albany. It is at the head of steam navigation, on the Boston and Maine, the New York Central, and the Delaware and Hudson railroads. Communication is likewise furnished by the Erie and Champlain canals. The river is crossed by a number of substantial railway and wagon bridges. Transportation within the city is provided by a system of electric railways, which are connected with lines that extend to Albany and other cities. Many of the streets are substantially paved with stone and macadam. They are well drained by a system of sewers and lighted with gas and elec-The waterworks are owned by the municipality.

Troy is finely located on a rolling site, being level near the river and rising over a range of hills toward the east. Mount Ida is the highest elevation within the limits. Beman Park is one of many public resorts. Other public grounds include Lagoon Island, in the Hudson south of the city, and Warren's Hill Park, which overlooks the river. Washington Square contains the soldiers' and sailors' monument and a number of fine memorials are in Oakwood Cemetery, a burial ground of great beauty. This cemetery contains the remains of Gen. George H. Thomas and the Earl Memorial Chapel, a modern crematory. The residential section is beautifully improved with lawns and avenues of trees.

Troy has many substantial buildings of mod-These include the county ern construction. courthouse, the post office, the city hall, the Hart Memorial building, the Union Passenger Station, the Rensselaer Hotel, the Row Memorial building, and the Savings Bank building. The system of public schools is well organized and culminates in an advanced high school course. Among the educational institutions are the Emma Willard Seminary and the Rensselaer Polytechnic Institute, an important institution. It is the seat of the Troy Hospital, the La Salle Institute, and many charitable and benevolent institutions. The ecclesiastical buildings include the First Presbyterian, the Saint Paul's, the Saint Peter's, the Second Presbyterian, the Saint Mary's, the Saint John's, and a number of other churches. Several fine libraries are maintained, including the collections in the public library and in the Rensselaer Polytechnic

The city ranks fifth as a manufacturing center in the State. It has extensive water power facilities on the Hudson, owing to the extensive dam maintained by the State. The chief manufacturing enterprises include iron and steel works, paper and pulp mills, breweries, brick and tile yards, and flouring and grist mills. Among the general manufactures are clothing, hosiery and knit goods, scientific instruments, stoves, bells, and laundry machinery. A large wholesaling and jobbing trade is carried on with points in New York and New England. It has an extensive trade in cereals, manufactures, live stock, dairy products, and fruits.

The region with which Troy is included was a part of the grant of land to Van Rensselaer in 1629. Settlements began to be made soon after, but the town was not platted until 1787. It was first called Van der Heyden's Ferry, from an owner of the immediate tract upon which the town was built, and the present name was adopted in 1789. Its charter as a city dates from 1816. At the time of the War of 1812 it contained the large packing establishment of Samuel Wilson, who furnished the army with packed meat in barrels. He was familiarly called "Uncle Sam," which circumstance gave rise to the popular national nickname applied to the United States. Lansingburg, a village with a population of 12,597, was annexed to Troy in 1901. Population, 1905, 76,861; in 1910, 76,813.

TROY, a city of Ohio, county seat of Miami County, twenty miles north of Dayton. It is on the Cleveland, Cincinnati, Chicago and Saint Louis and the Cincinnati, Hamilton and Dayton railways. Transportation facilities are provided by several electric railway lines. The surrounding country is devoted to agriculture and stock raising. Among the chief buildings are the high school, the county courthouse, and many churches. The manufactures include wagons and carriages, flour, earthenware, and

machinery. It has waterworks and an electric lighting and power plant. Population, 1900, 5,881; in 1910, 6,122.

TROYES (trwa), a city in France, capital of the department of Aube, 98 miles southeast of Paris. It is on the Seine River and is connected by a number of important railroads with other trade centers. Among the manufactures are cotton and woolen goods, hardware, pottery, soap, paper, and machinery. The surrounding country is fertile, producing fruit, raw silk, and cereals. A Gothic cathedral, dedicated to Saint Peter in 872, occupies an imposing site. It has a public library of 112,000 volumes, numerous churches, a fine museum, and various educational and scientific institutions. Gas and electric lighting, waterworks, pavements, and street railways are among the public improvements. Troyes was long a Roman possession, when it was known as Augustobona. It was the scene of a battle between Napoleon and the allies in 1814. The Germans occupied it in 1870. Population, 1916, 53,447.

TROY WEIGHT, a scale of weights used for weighing silver, gold, and jewelry, so named from Troyes in France. The troy pound is equal to 22.79 cubic inches of distilled water. It contains 12 ounces of 20 pennyweights each, and the pennyweight contains 24 grains. A pound troy is identical with the pound of apothecary's weight, and the ounce and grain of these two weights are correspondingly the same. The weight of the pound compared with the avoirdupois pound is as 144 to 175, and the troy ounce is to the avoirdupois ounce as 192 to 175.

TRUDEAU (troo-do'), Edward Livingston, physician, born in New York City, Oct. 5, 1848. He studied at Columbia College and the College of Physicians and Surgeons, in New York, and practiced for a brief time in his native city. In 1873 he took up his residence in the Adirondack Mountains, at Saranac Lake, where he founded the Adirondack Cottage Sanitarium for the treatment of tuberculosis. He was the first American to employ the open-air method in treating this disease and was singularly successful in effecting cures among consumptives. Numerous and valuable contributions on this treatment were made by him to medical publications

TRUE, Alfred Charles, educator, born in Middletown, Conn., June 5, 1853. After attending the public schools, he entered Wesleyan University, where he graduated in 1873, and the same year was made principal of the high school at Essex, N. Y. He became an instructor in the State normal school at Westfield, Mass., in 1875, serving until 1882, and was professor in the Wesleyan University from 1884 until 1888. In the latter year he accepted a position in the United States Department of Agriculture and in 1902 was made dean of the first graduate school of agriculture in the United States, at

Columbus, Ohio. Subsequently he was prominent in organizing and conducting agricultural investigations in Hawaii and Porto Rico, and became known as one of the leading students of agricultural education and research of America. He edited the Experiment Station Record for ten years. His publications include "Agricultural Experiment Stations in the United States," "Education and Research in Agriculture in the United States," and "Progress in Agricultural Education."

TRUFFLE (tru'f'l), a genus of plants belonging to the fungi, several species of which are cultivated as food plants. These plants are subterranean, without visible roots or stems, and grow to the size of a large potato. They are cultivated to a considerable extent in Europe, especially in the southern part, and form an ingredient in many dishes, both for the flavor and their nutritious qualities. Since no stem or other visible growth appears above the surface, the plants are found through the agency of dogs that are trained to hunt them by means of the scent. While truffles may be grown in Canada and the United States, they are little known in this country as an edible food.

TRUMBULL (trum'bul), Henry Clay, author, born in Stonington, Conn., June 8, 1830; died in 1903. He studied in Williston Seminary and in 1858 removed to Hartford to engage in railroad business, but subsequently became Sunday-school missionary for Connecticut. After being ordained a minister in the Congregational Church, he served as chaplain in the war, and in 1865 became secretary of the American Sunday-School Union for New England. In 1875 he removed to Philadelphia, where he published the Sunday School Times. He visited Arabia and other countries of the East in 1881. His writings include "Teaching and Teachers," "Studies in Oriental Social Life," "Some Army Sermons," "The Captured Scout of the Army of the James," "Children in the Temple," and 'A Model Superintendent.'

TRUMBULL, John, painter, born in Lebanon, Conn., June 6, 1756; died in New York City, Nov. 10, 1843. After graduating at Harvard University, in 1773, he studied painting in Boston and subsequently with Benjamin West in London. He was imprisoned while in London, in 1780, owing to the intense excitement prevailing at the time Major André was executed as a spy. His productions include numerous historical scenes in connection with the American Revolution and portraits of leading Americans. He was employed in 1807 to paint a number of subjects for the capitol, these including "The Surrender of Burgoyne," "The Declaration of Independence," "The Surrender of Cornwallis," and "The Resignation of Washing-Another fine historical picture is his "Battle of Bunker Hill." He gave a collection of 58 historical paintings, including a number

of portraits of eminent Americans, to Yale University.

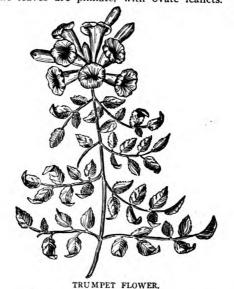
TRUMBULL, Jonathan, jurist and statesman, born in Lebanon, Conn., Oct. 12, 1710; died there Aug. 17, 1785. In 1727 he graduated from Harvard University, and subsequently engaged in the law profession. He was chief justice of Connecticut from 1766 to 1769 and was Governor of the colony from 1769 until 1783. He was one of the earliest among the colonial governors to espouse the American cause, refusing to obligate himself by oath to enforce the Stamp Act, and was a trusted supporter and confidential adviser of Washington, who quite often spoke of him as Brother Jonathan, a term since frequently applied as equivalent to the people of the United States. A degree was conferred upon him by Yale in 1779. The University of Edinburgh, Scotland, gave him a degree in 1783.

TRUMBULL, Lyman, jurist and statesman, born in Colchester, Conn., Oct. 12, 1813; died in Chicago, June 25, 1896. He was admitted to the bar in 1837 and in the same year began the practice of law at Belleville, Ill. He was secretary of State for Illinois from 1841 to 1842 and justice of the Illinois supreme court from 1848 until 1853. In 1854 he was chosen a member of Congress as a Democrat and the following year became United States Senator, serving as such until 1873. He differed from Stephen A. Douglas on the question of slavery and in 1861 supported Abraham Lincoln for President, serving in the Senate for five years of his eventful career as a Republican. He was one of the senators who agreed with the reconstruction policy of Andrew Johnson, hence he acted with the Democrats from that time until the close of his political life. Subsequent to his retirement from public life he had a lucrative

law practice in Chicago. TRUMPET (trump'et), a wind musical instrument which dates from remote antiquity, distinguished for its clear and penetrating tone. It is formed of a single tube of brass or silver curved into a convenient shape, having a mouthpiece at one end and a bell at the other. Most modern instruments of this class are provided with crooks and slides, thus raising or lowering the pitch as the tube is shortened or lengthened respectively. The sounds are modified by the action of the player's lips and may be varied by the addition of slides, valves, and keys. It is a popular instrument in military bands, and is used to a considerable extent in war. For ear and speaking trumpet, see Sound.

TRUMPET FLOWER, the popular name of several flowering vines, which have a woody stem and bear flowers formed like a trumpet. They are native to the Southern United States, but are now cultivated extensively in gardens and house yards throughout the Northern States and the southern part of Canada, where they are popular as vines designed to climb trellis

work and porches. About fifty American species have been enumerated. The trumpet flower is a woody vine. It has an abundance of rootlets and climbs to a great height. The flowers are in clusters, usually of a reddish color, and the leaves are pinnate, with ovate leaflets. A



species known as the Tacoma Australis is an ornamental Australian climber. The great-flow-ered trumpet flower is native to China. Other species are found in Eastern Asia, South America, the West Indies, and Australia.

TRURO (tru'rō), a city of Nova Scotia, capital of Colchester County, on the Salmon River, sixty miles northeast of Halifax. It is near the head of Cobequid Bay, on the Intercolonial Railroad, and is surrounded by a fertile agricultural region. The chief buildings include the county courthouse, the high school, the Truro Academy, the Stanley Hotel, and the Nova Scotia Agricultural College. Among the manufactures are clothing, boots and shoes, flour, leather goods, machinery, and musical instruments. The place was founded in 1761 by loyal settlers from New Hampshire. Population, 1901, 5,993; in 1911, 6,107.

TRUSTEE (trus-te'), the term applied to a person to whom is intrusted the right to hold in trust certain property, either real or personal, for the benefit of another, or for some special purpose. Any one who has an interest in property so held, whether the interest be exclusive or limited, is termed a beneficiary. It is not obligatory upon any one to assume the responsibility of a trust, but if he undertakes such a duty it must be discharged until a full settlement is made, or he is released upon the order of a court or an agreement of the beneficiaries. Declarations or creations of trusts or powers in relation to real estate are executed in the same manner as those of conveyance, but

this provision does not apply to trusts resulting from the operation or construction of law. Most states make breach of trusts a crime punishable by law, and in all cases the trustee is liable for the misapplication of funds or the consequences of a breach of trust. If several trustees act conjointly in the administration of a trust, each is liable only for his own acts. See Trusts.

TRUSTS, the combinations of corporations or of individuals which are maintained to fix the prices of their products, in part at least, on the principle of monopoly. The term corporation is applied to the combination of individuals which are maintained for productive and commercial purposes, but trusts are by no means confined to corporations. However, it may be said that trusts are an outgrowth of associations which seek to control large interests in promoting commerce and industry. Besides the primary object of trusts to diminish the cost of production, they seek to affect the market by limiting the output as well as to make the prices as favorable to the parties who constitute the combination. Those who promote the organization and maintenance of trusts defend them from the industrial point of view that free and open competition is ruinous in its nature, especially where intercourse between persons in different localities is easily carried on and where a large amount of capital is invested in fixed plants. They also argue that there is a material saving industrially where combinations are maintained, and claim that the competitive system tends to lessen the quality of the product as well as to require the investment of larger sums of money to produce a reasonably fair output.

In 1900 the government published a census bulletin in which it was shown that 183 corporations controlled 118 idle and 29,029 active piants. Formerly the greater number of plants involved, such as mills and factories, were operated as independent properties, but the combinations brought these industries under the control of a very few men. As a whole the effect was not beneficial to laboring men and, on the other hand, the public was obliged to pay a somewhat higher price for products turned out by these institutions. In many places were manufacturing establishments that had received aid by local capitalists, some of which were operated by the trusts, but a majority of these remained idle or were converted into plants producing commodities different from those they were established to manufacture. Investigation also developed the fact that prices of products were not dependent so much upon the cost of manufacture as they were upon whether independent plants still continued to operate. As a whole the prices were higher and uniform where the trusts controlled the market, and they were in a few cases below the actual cost of production where competition was maintained, the promoters being desirous of disorganizing or ruining the business of competitive industries.

The Department of Commerce and Labor, established in 1903, includes the Bureau of Corporations. This branch of the government has investigated many of the so-called trusts, such as seek to control the output and price of paper, tobacco, beef, steel and iron, flour, and mineral oil. Oscar L. Straus, in 1908, then Secretary of Commerce and Labor, published the view that reforms and the control of trusts must come through some general system of publicity. In line with this view, the government and many of the states prosecuted many violaters of the anti-trust laws. The prosecutions include those against the International Harvester Company, the American Sugar Refining Company, the American Cigar Company, and the International Paper Company. Many states imposed heavy fines upon trusts, especially Texas, where the Waters-Pierce Oil Company was fined \$1,623,900.

A strong tendency to overcapitalize many of the larger trusts has been observed in many instances. This has resulted in the issuance of a large amount of stock which has been sold to the public in prosperous times, but which afterward proved comparatively of little value. The 183 corporations referred to above had an actual capital of \$1,458,522,573, but their authorized capitalization was \$3,607,539,200, and in addition they issued bonds amounting to \$3,085,-200,868. Thomas W. Lawson, of Boston, contributed a series of articles to Everybody's Magazine in 1905 in which he showed the enormity of overcapitalization of the Standard Oil Company, the Amalgamated Copper Company, the United States Steel Corporation, and other similar organizations doing business on a very large scale, both in the production and sale of commodities and in selling stock of questionable value upon the public. The United States Steel Corporation was incorporated under the laws of New Jersey in 1901 with a capital of \$1,100,-000,000, absorbing at the time eleven of the largest steel, iron, tin, bridge, wire, and tube companies of the United States. Other great combinations include the following:

CA	PITALIZATION.
National Bread Company	. \$ 3,000,000
National Witch Hazel Company	
Hartford Carpet Company	5,000,000
International Harvester Company	
American Hydraulic Brick Company	
Photographic Dry Plate Company	
United Box Board and Paper Company	
United States Cotton Duck Company	
American Shipbuilding Company	
American Can Company	
American Plow Company	
American Smelting and Refining Company	
Amalgamated Copper Company	

TSAD, Tchad, or Chad (chad), a freshwater lake of Central Africa, in the Sudan, immediately north of Kamerun and east of the Royal Niger Territories. It is 150 miles long, 118 wide, and 900 feet above sea level. area depends upon the season and rainfall, ranging from 10,000 to 20,000 square miles. Several large rivers flow into it, including the Shari and Yaobe. The shores are low and swampy and surrounding it are vast regions that are covered with reeds and papyrus. The general depth ranges from ten to eighteen feet in ordinary seasons, but some years the water is much deeper and covers many of the islands and large tracts of adjacent marshes. The fact that it is a fresh-water lake, although it has no outlet to the sea, is ascribed by some to the circumstance that it sometimes overflows and covers a region lying about 300 miles toward the northeast. The vicinity of Lake Tsad is inhabited by native pagans, who are of an unusually dark color and find employment in cultivating cotton, corn, and vegetables. They rear stock, such as cattle, horses, and sheep. Large numbers of crocodiles, hippopotami, fish, and water fowl are abundant. Several thriving commercial towns are in its vicinity, including Mawo, Kuka, and Massena. Nachtigal (q. v.) explored the lake in 1871 and 1872.

TSARITSYN (tsa-re'tsin), a port city of Russia, in the government of Saratov, on the Volga River. It has transportation facilities by railways and navigation on the Volga and is surrounded by a fertile farming and grazing country. The principal buildings include the townhall, grain elevators, the public library, and a large Lutheran Church. Salt, mustard, machinery, and clothing are the principal manufactures. The city has an extensive trade in farm produce, petroleum, fish, and lumber. Population, 1916, 59,678.

TSARSKOYE SELO. See Tzarskoye.

TSCHAIKOWSKY (chī-kôf'ske), Peter Ilyitch, composer, born at Votkinsk, Russia, April 25, 1840; died Nov. 5, 1893. He studied music at the conservatory of Saint Petersburg, after having devoted several years to the study of law, and in 1866 became professor of harmony and musical history in the Conservatory of Moscow. After 1877 he devoted his attention entirely to composition. His products consist of numerous symphonies, operas, solos, and overtures. He made an extensive visit to America in 1875 and again in 1891, when he appeared with much success in the leading cities of Canada and the United States. In response to an invitation of Walter Damrosch he took part in the dedication of Carnegie Hall, New York. His compositions include "The Tempest," "Disappointment," "Why Are the Roses so Pale," and "Romeo and Juliette."

TSETSE (tsěť sé), a small blood-sucking fly of South Africa, slightly larger than the gadfly. The color is brown with yellow transverse bars on the abdomen, beyond which the wings project considerably. It is an active insect, especially in the warmer part of the day, and can scarcely be caught by the hand. The bite is as harmless to man as it is to the mule and the wild animals native to the country, but it is decidedly poisonous to oxen, horses, and dogs. No harmful effect is perceived at first, but in a few days the nose and eyes begin to run. This symptom is followed by swelling of the lower jaw, staggering, relaxation of the muscles, and finally Some of the animals bitten linger in an affected condition for several months, often recovering when the cases are extended. Livingstone lost 43 oxen by the attack of this pest on one of his journeys. These insects are very numerous in some regions, often attacking horses and cattle in swarms.

TUAREGS (too-ä'regz), a nomadic people of the Sahara Desert, closely allied to the Ber-They inhabit the Sahara from Fezzan west to the Atlantic. The hair is straight, the physique is well developed, and the features resemble those of the Caucasian rather than the African. In religion they are Mohammedan and they are fanatic and warlike. Formerly they were monogamists, but became polygamists after adopting the Moslem faith. The women go unveiled and take part in public affairs.

These people number about 300,000.

TUBERCULOSIS (tů-ber-ků-lô'sis), a disease due to the presence or formation of tubercles within some organ or tissue, as pulmonary tuberculosis and renal tuberculosis. Tubercles are small granular tumors, or nodules, which may be developed in different organs or parts of the body, and range in size from a mere point to an eighth of an inch in diameter. If only a few prevail in any organ, they may remain harmless, but when numerous they form a tubercular mass that tends to spread and destroy the surrounding structure. Dr. Koch (q. v.), in 1882, discovered that they are due to a microscopic organism called the tubercle bacillus, which produces a cheesy degeneration of the normal tissue, resulting eventually in tuberculosis. Formerly the disease was considered hereditary, but now it is known to spread only by infection. However, some individuals have a predisposition toward the disease, in which case the system is unable to throw off the infection. Ordinarily it may be produced by any cause which lowers the vital conditions, such as dampness of soil and atmosphere, impure air, bad ventilation, overcrowded rooms, and filthy habits. The chief seat of the disease is in the lungs, brain, kidneys, liver, bronchial tubes, serous membranes, and intestines. It affects the lower animals as well as man. The disease may be transmitted to man by the milk and flesh of tuberculous cattle. However, the sputum of patients affected by the disease is the greatest source of danger, since the bacilli are thrown off in this way in very large numbers. The germ is not killed by drying or ordinary exposure, hence may be taken up in the dust and carried to the lungs of some person by inspiration of air.

Much anxiety has been occasioned by the remarkable prevalence of tuberculosis in large cities, and it is thought that many cases are

due to the consumption of affected meat and to overcrowded tenements. A report published in 1900 shows that 15,417 deaths occurred in 14,480 tenement houses in New York City, and that the deaths due to tuberculosis in Great Britain average annually 70,212. The International Tuberculosis Congress, promoted for the establishment of sanitariums to guard against and treat pulmonary and other forms of tuberculosis, held an important session at Berlin, Germany, May 24-27, 1899. It was attended by delegates from most countries, including Canada and the United States, and did much to call attention to the widespread prevalence of the disease and to the most feasible means to cope with it. Swine, chickens, rabbits, cattle, and other domestic animals are subject to various forms of the disease. In 1888 Albert Landerer, of Stuttgart, Germany, recommended sodium cinnamate as a cure, but it cannot be said to be more than a preventive in some cases. Hospitals for the care of persons affected with tuberculosis have been established in many countries. Dr. Koch originated the specific treatment with tuberculin, which is now used in the examination of individuals, both man and lower animals, that are supposed to be affected. Other treatments include those which employ antitoxins, antitubercle serums, cod-liver oil, and the X-ray. However, every curative method requires an abundance of exercise and life in the open air.

TUBEROSE (tūb'rōz), an ornamental bulbous plant, native to tropical America and Asia, cultivated in gardens for its fragrant white



grows to a height of two to three feet, the flowers appearing at the upper part, while clusters of leaves are borne at the lower part.

In

TÜBINGEN (tü'bing-en), a celebrated university city of Germany, in Württemberg, twenty miles southwest of Stuttgart. It is on the Neckar River, at the border of the Black Forest (Schwarz Wald), and may be reached by railway. Duke Eberhard founded the famous university in 1477, when it had four faculties, and it soon became a distinguished seat of learning. In 1534 the university adopted the reformed faith, added a Protestant theological seminary in 1536, and provided a Roman Catholic theological faculty in 1817. A powerful influence has been exercised by the University of Tübingen on the religious and scientific thought of Europe. Among its eminent teachers are Melanchthon, Reuchlin, and Baur. At present the university has ninety professors and teachers. It has excellent botanical gardens, laboratories, a gymnasium, and collections in zoölogy, mineralogy, and comparative anatomy. The library has 395,000 volumes. The attendance is about 1,600 students, of whom about 300 are foreigners. Tübingen is beautifully situated and improved thus making it a favorable place for study. It has telephones, electric lights, pavements, and rapid transit. Population, 1905, 16,809; in 1910, 17,986.

TUCKAHOE (tŭk'à-hō), the common name of a peculiar vegetable growth found in the southern part of the United States, called also Indian leaf or Indian bread. Its development is not well understood. It usually forms large masses upon old roots and has been classed as a spurious fungus growth. The exterior is bark-like and the interior is of a whitish compact formation. Like the European truffle, it grows only under the surface, often several inches in diameter. The interior is bitter and unfit to eat, but it is used to some extent as a medicine.

TUCKER, Saint George, jurist, born at Port Royal, Bermuda, June 29, 1752; died in Winchester, Va., Nov. 10, 1828. He studied at William and Mary College, served in a naval expedition against Bermuda in 1775, and two years later returned to the colonies to take part with the American Revolutionists, receiving a promotion to the rank of lieutenant colonel at the siege of Yorktown. He married Frances Bland Randolph, mother of John Randolph, in 1778. Subsequent to the war he became judge of the general court in Virginia, revised the digest and laws of that State, and served for some time as professor of law at William and Mary College. President Jefferson appointed him on the court of appeals in 1803, in which office he served until 1811, when he became judge of the United States district court in eastern Virginia. His writings include "Letters on the Alien and Sedition Laws" and "Dissertation on Slavery." He edited an edition of Blackstone's "Commentaries" and published "Commentary on the Constitution."

TUCKERMAN (tŭk'er-man), Henry Theo-

dore, author, born in Boston, Mass., April 20, 1813; died in New York City, Dec. 17, 1871. Ill health required him to abandon college before completing the course. He made an extensive tour in Europe, visiting Italy and other European countries, and in 1835 published "The Italian Sketchbook." On returning to America, he pursued a postgraduate course and subsequently devoted his attention wholly to literature. Many of his early writings, such as essays, criticisms, and biographical sketches, were published in magazines. His published works include "Rambles and Reveries," "Memoworks include "Rambles and Reveries," "Memorial of Horatio Greenough," "Book of American Artists," "Leaves from the Diary of a Dreamer," "Thoughts on the Poets," "Life of John Pendleton Kennedy," "America and Her Commentators," "Characteristics of Literature," and "Essay on Washington."

TUCSON (tū-sŏn'), a city in Arizona, county seat of Pima County, on the Santa Cruz River, sixty miles north of the Mexican boundary. It is on the Southern Pacific Railroad and is surrounded by a productive mining and agricultural country. Among its principal buildings are the county courthouse, the public library, the high school, the Saint Joseph's Academy, a Presbyterian school for Indians, the Desert Botanical Laboratory, the Church of Saint Xavier, and the University of Arizona. The streets are lighted by gas and electricity and have numerous other modern improvements. It has a large trade in live stock, wool, hides, and copper, gold, and silver ores. A short distance south of the city is the Papago Indian Reservation. Tucson was founded by Jesuits in 1660 and became a possession of the United States in 1853 as a part of the Gadsden purchase. It was the capital of Arizona from 1867 to 1877. Population, 1910, 13,193.

TUCUMÁN (too-koo-man'), a city of Argentina, capital of the province of Tucumán, on the Tala River. It is situated in a fertile farming and stock-raising country, which is rich in timber. The principal buildings include a Jesuit college, several convents, a cathedral, and a number of government buildings. Among the manufactures are leather, sugar, furniture, lumber products, brandy, clothing, and machinery. Gas and electric lights, rapid transit, and a number of other modern improvements have been introduced. The city has a large trade in live stock, lumber, and merchandise. A congress met in Tucumán in 1816 and declared the La Plata states independent of Spain. Population, 1908, 51,046; in 1912, 80,685.

TUDOR (tū'dēr), a dynasty of England. It was of Welsh extraction and occupied the throne of England from 1485 until 1603. Tudor is the Welsh equivalent of Theodore. Owen Tudor was the first of the family and was first known as a brewer in Anglesey, but subsequently took part in the Battle of Agincourt. His military record commended him to Cath-

arine, widow of Henry V., who made him clerk of the household and afterward entered into a marriage contract with him. Public indignation at this marriage ran so high that the queen was forced to seek refuge in a convent, while Tudor was imprisoned. He escaped soon after and found protection under Henry VI., who afterward made him lieutenant of Denbigh. Two sons resulted from this marriage, named Edmond and Jasper. The king bestowed the earldom of Richmond on Edmond and the earldom of Pembroke on Jasper. The Earl of Richmond married Margaret Beaufort, a descendant of John of Gaunt, and their son became Henry VII. of England, who, by marrying the daughter of Edward IV., united the houses of Lancaster and York, thus ending the War of the Roses. The five Tudor sovereigns are Henry VII., Henry VIII., Edward VI., Mary, and Elizabeth. Among the noted events of the period including the reigns of these sovereigns are the Reformation and the establishment of the Anglican Church. See England.

TUESDAY (tūz'dā), the third day of the week, so named from Tiw, or Tyr, the son of Odin, the Scandinavian god of war. In the Roman calendar it is called *Dies Martis*, from Mars. Shrove Tuesday occurs immediately before Lent.

TUFA (tū'fà), the name applied to any coarse rock whose particles are held together by lime or silicate. The term is of Italian origin, meaning calcareous rock. Volcanic tufa is the name applied to rock of this class which emanates from volcanoes.

TUFTS COLLEGE, a coeducational institution of higher learning, at Medford, Mass., under the control of the Universalists. It was founded in 1852 and was so named from Charles Tufts, who made a number of gifts to the institution. The departments include those of medicine, dentistry, divinity, liberal arts, and engineering. A biological laboratory is maintained at South Harpswell, Me. The Barnum Museum of Natural History, the gift of P. T. Barnum, has a fine zoölogical collection. The value of the property is \$2,250,000 and the library contains 82,000 volumes. It has a faculty of 275 and an attendance of 1,750 students.

TUILERIES (twel-re'), the name of a splendid palace and gardens of France, situated in Paris, on the right bank of the Seine River. The site was originally outside the city and was occupied by tile works, hence the name. The property was purchased by Francis I., who bestowed it as a present on his queen mother, Catherine de' Medici. In 1564 the latter began to build the palace after plans by Philibert Delorme. Henry IV. enlarged it in 1600 and it was subsequently modified and improved by Louis XIII., who was the first to make it a royal residence. Later additions were made by Louis XIV., Napoleon I., and Napoleon III. Louis XVI. was forced by the people to make

it his abode in the memorable Revolution of 1789 and from that time it continued to be the royal and imperial residence until 1871, when it was destroyed by the Commune. The ruins were removed in 1883 and extensive improvements were made on the grounds, converting the fifty-acre tract into a beautiful park.

TULA (too'la), a city in Russia, capital of the government of Tula, on the Upa River, 118 miles south of Moscow. It has connection with other trade emporiums by several railroads and canals and is surrounded by a fertile grain and dairying country. Among the manufactures are cutlery, bell metal, edged tools, brushes, cordage, soap, leather, clothing, firearms, and The large cannon factory was machinery founded by Peter the Great, which has continued to be the source of large supplies for the Russian army. Tula occupies a low site, but has considerable street and general improvements. It is lighted by gas and electricity. The streets are improved by waterworks, pavements, and means for rapid transit. It has a large trade in farm produce and manufactures. Population, 1916, 146,486.

TULANE UNIVERSITY, an institution of higher learning at New Orleans, La., established by the State Legislature in 1847. It was known as the University of Louisiana until 1884, when it received a bequest of \$1,050,000 from Paul Tulane (1801-1887), and at that time the name was changed to Tulane University of Louisiana. About the same time Josephine Louisa Newcomb of New York made a gift of \$100,000 for the education of white girls and young women, with which fund the H. Sophie Newcomb Memorial College was erected. It has a productive endowment fund of over \$3,000,000. The university property has a value of \$3,275,000 and as a whole is one of the largest and best equipped institutions of the The courses include medicine, arts, sciences, pharmacy, law, philosophy, and engineering. It has a library of 70,000 volumes and a beautiful campus. Near the grounds is the celebrated Audubon Park. The faculty includes 315 professors and instructors and the attendance is 2,800 students.

TULIP (tū'lip), a genus of bulbous plants of the lily family, including several hundred species. Most of the cultivated varieties are native to Asia Minor and Southern Europe. The common garden tulip is indigenous to the Levant and is now cultivated on a large scale in flower gardens. The sweet-scented tulip is highly fragrant, bearing large leaves and a single flower. Many varieties of colors have been obtained by cultivation. Large prices were paid in the 17th century for new species, the tulip being greatly in fashion at that time, and even now special bulbs have considerable value in the market. Tulips are cultivated most extensively in Holland, both for the flowers and the bulbs, which are exported in large quantities. A large and

showy species, the *Turkestan tulip*, is prized for its deeply colored scarlet flowers. Among the species grown extensively are the *parrot*, *florist's*,

garden, show, and sweetscented tulips. These species may be readily forced in greenhouse culture.

TULIP TREE, a large tree closely allied to the magnolias. It is native to the forest of North America, extending from the Gulf of Mexico to Canada, and is so called from the resemblance of its flower to the tulip. In some sections it is known as whitewood, canoe wood, or poplar. It is one of the largest native trees, attaining a height of 90 to 150 feet and a diameter of eight to nine feet. The trunk is covered with ash-colored bark and the leaves are about four inches long,



SWEET-SCENTED TULIP.

smooth, and peculiarly truncated, giving them an appearance as if cut off at the end. Its wood is light, straight-grained, and easily worked, and is employed for carpentry and cabinetwork.

TULSA, a city of Oklahoma, county seat of Tulsa County, on the Arkansas River, about 45 miles northwest of Muskogee. It is on the Santa Fe, the Missouri, Kansas and Texas, and other railroads, and is surrounded by a fertile section. The features include the courthouse, the high school, and a large general trade. West Tulsa was annexed in 1909. Population, 1910, 18,182.

TUMOR (tū'mer), an abnormal swelling on any part of the body, not caused by inflammation. The term is limited to growths that are apparently without purpose and usually without a well-understood cause. In structure, the tumors are a reproduction of the normal tissue, but they differ from it in being less fully developed and for the additional reason that there is a tendency to undergo degenerative changes. In some cases they are malignant, that is, they are liable to spread throughout the system after being removed, appearing to spread through the agency of the blood and lymphatic current. A benign or simple tumor does not reappear when removed by artificial means.

Malignant tumors have attracted marked attention for many centuries. They are divided into the two groups known as cancers and sarcomata. Since cancers are composed of epithelial cells, they occur in the parts of the body where there is normally epithelium, as in the breast or stomach. Sarcomata appears mainly in

the tendons and about the bones, and their composition is mainly connected tissue. Theories differ vastly as to the cause of tumors. Among them are the views that they result from a general disorder of the blood, that they are due to local injury and irritation, that some derangement during the period of foetal life subsequently causes abnormal growths, and that they may be generally assigned to the action of microbes.

TUNDRA (toon'dra), the name applied to the plains bordering on the Arctic Ocean, both in Siberia and North America, so called from the Finish word tentur, meaning marshy plain. These regions are characterized by swamps of bog moss and lichens, but the surface is quite level or gently undulating. Some tundras have numerous small lakes, where small species of ferns and rushes grow, and in many places flowering plants are numerous. In the summer they are frequented by wild birds, which nest in the inaccessible morasses, and during the winter the region is extremely cold. During the summer the soil melts to a depth of one or two feet below the surface, but beyond that depth the earth remains frozen throughout the year. Vegetable growth causes the surface to rise slowly, hence extensive peat bogs are formed. Much silt and great layers of ice are carried from the warmer regions by means of rivers on the approach of spring, which accounts in part for the bones of extinct animals, such as the mammoth and the rhinoceros, being found securely protected from the atmosphere.

TUNGSTEN (tung'sten), a metallic element closely related to uranium. It is found chiefly in the mineral wolframite, a tungstate of iron and manganese. It occurs native with oxide of tin. The color is steel-gray and it can be melted only at white heat. It is hard, brittle, and crystalline. The chief use of this metal formerly was as a material for increasing the hardness and tenacity of steel. Since 1907 it has entered largely into electric lighting, mainly as a filament in lamps, in which it has displaced the ordinary carbon incandescent lamps to some extent. Although it is more expensive and fragile than the carbon lamp, the normal life is longer and the efficiency is greater. See Chemistry.

TUNGUS (toon'goos), a native race of Asia, found chiefly in the eastern part of Siberia. They inhabit the northern part of Saghalien, whence they extend westward to the Yenesei River, and scattering settlements are found as far south as the country of the Manchus. They engage chiefly in hunting and a pastoral life and may be classed among the nomadic races of Asia.

TUNIC (tū'nīk), an under-garment worn by the ancient Greeks and Romans. It reached to or below the knees, was confined to the waist by a girdle, and was made either with or without sleeves. In Rome the tunic was a common garment of both sexes and was worn under the palla and the toga. The poorer classes made it

of linen, but the wealthy used silk of an inferior

TUNING FORK, an instrument made of steel and used to regulate the pitch of the voice or of a musical instrument. It has two prongs that spring from a handle of the same material, and the latter serves as a sound post to transmit the vibrations of the fork. To set the fork in vibrations, one of the prongs may be struck against any hard substance, or the prongs may be pressed together and then released quickly. By filing the ends of the prongs, or between them near the ends, a tuning fork may be made sharper, and it may be made flatter by filing at or near the bend. The tuning fork is generally tuned to C in the treble C clef, because organ builders start their tuning from that note.

TUNIS (tū'nīs), a city of North Africa, capital of the state of Tunis, on the Gulf of Tunis, an inlet from the Mediterranean. It occupies a fine site near the mouth of the Mejerdah River, about three miles from the ruins of ancient Carthage. The older streets are narrow and unpaved, but the newer parts of the city have a European appearance, being clean, paved, and lighted by gas and electricity. Two walls surround the city and it is defended by several forts and a castle. The most important structures include the palace of the bey, several public offices, the cathedral, the Moorish college, and a number of Greek, Roman, and other Christian houses of worship. Many of the older buildings are low and have no windows toward the streets, but the newer part of the city contains substantial blocks of business houses and residences in the French style. It has several fine parks and fountains. Water for city use is supplied by an aqueduct built in ancient times from Jebel Zaghwan, which is spoken of in the history written by Strabo. Telephones, telegraph connections, and rapid transit have been constructed within recent years. The harbor is safe and commodious. It has extensive railroad connections with the interior, making the city an important export and import market. Among the manufactures are olive oil, silk and woolen textiles, soap, leather, turbans, tapestry, shawls, clothing, and native machinery. The exports embrace manufactures, gold dust, fish, ivory, cattle, coral, grain, and fruits. About one-third of the inhabitants are Europeans. Population, 1916, 177,582.

TUNIS, a country of North Africa, one of the Barbary States, forming a dependency of France. It is bounded on the north and east by the Mediterranean, on the southeast by Tripoli, and on the west and southwest by Algeria. It has an area of 64,240 square miles. The coast line is irregular. It is indented by a number of extensive inlets, the most important being the Gulf of Gabes. Cape Blanco, on the northern shore, is the most northerly point of Africa, and east of it is Cape Bon. The northern coast is precipitous and rocky, but the eastern shore region is

2935

generally low and sandy, and the coastal plain is quite fertile. Ranges of the Atlas Mountains traverse the central part, rising not more than 6,500 feet above the sea. In the interior are a number of extensive lakes, among them Lake The Mejerdah, rising in the Atlas Faroun Mountains and flowing into the Mediterranean near Tunis, is the principal river. The northern part of Tunis is generally fertile, and the southern part merges into the Sahara Desert. In the region toward the south are numerous mineral springs and flowing wells serviceable in irrigating the more arid portions. Salt, galena, lead, saltpeter, quicksilver, phosphate, and mineral oil are among the chief minerals. The sponge and tunny fisheries are important. Tunis has extensive and valuable forests, especially in the mountains, and large tracts are cultivated as olive plantations.

Agriculture is the chief occupation. The principal farm products are wheat, barley, oats, cotton, grasses, and tobacco. Buffaloes, cattle, camels, horses, and sheep are reared in abundance. The fruit cultivated includes dates, olives, grapes, oranges, lemons, bananas, and other varieties. The wild animals are largely extinct, but the chase still offers opportunities to secure the wild boar, quail, partridge, wolf, and many aquatic birds. Fully 375,000 acres are covered by the valuable cork trees, which supply large quantities of marketable cork. Among the manu-

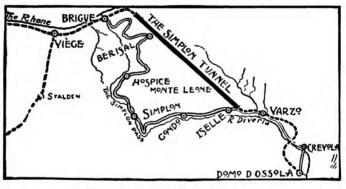
factures are woolen and silk textiles, cochineal, olive oil, soap, sponges, leather, metalware, wine, and machinery. The exports include phosphate, wheat, cattle, barley, olive oil, alfalfa, sponges, fish, cork, and tanning bark. Caravans carry on a large trade with the Sahara and other regions toward the south. In 1917 the country had 1,275 miles of railway in operation, most of which belong to the state. A large part of the trade is with France, Great Britain, Germany, and Italy. The government is administered under the native bey, who is assisted by nine ministers as heads of departments.

isters as heads of departments. Tunis is the capital and largest city. Other cities of importance include Sousa, Bizerta, Kairwan, and Sfax.

The inhabitants are principally Berbers, Moors, Kabyles, and Arabs, who are chiefly Mohammedans. A number of Christian missionaries and public schools are maintained, and several secondary and higher institutions of learning have been established under French supervision. The Jews have attained a considerable foothold in commercial enterprises and maintain a number of synagogues and schools. A high per cent. of illiteracy prevails. The region occupied by Tunis corresponds nearly to

that of ancient Carthage, and on it were fought many of the famous battles of Hannibal, Scipio, Hamilcar, and the Jugurthine leaders. It was overrun by the Vandals in 429. Subsequently it passed to the Greeks and later to the Mohammedans. In the 13th century it became independent of European influence, but Charles V. soon made it tributary to Spain. The Spaniards were driven from Tunis under Sultan Selim in 1574, when it was made a Turkish province. It was essentially a pirate state until 1816, when piracy and the slave trade were suppressed. In 1882 it was annexed as a French province and since then it has advanced materially in prosperity. Population, 1916, 1,982,050.

ty. Population, 1916, 1,982,050. TUNNEL (tŭn'nĕl), a passage cut through an eminence, such as a hill, rock, or mountain, to afford passage for railways, highways, canals, or aqueducts. Tunnels are constructed for similar purposes under towns and rivers, both classes dating from remote antiquity. In the early history of tunnels the work was done exclusively by hand, the rocks being broken either by sledges or by the agency of fire, but in modern times powerful explosives and elaborate machinery are utilized. The method of proceeding in tunneling depends chiefly upon the kind of materials to be excavated. To ascertain the character of such materials, borings are made and trial shafts are sunk from the surface. The trial shafts are afterward utilized in most of the works for ven-



THE SIMPLON TUNNEL.

tilation purposes, air pumps being provided to facilitate circulation. Tunnels pierced through solid rock have a sufficiently strong roof, but others have an arched roof lined with brickwork or stone masonry. Herodotus mentioned a tunnel on the island of Samos, having a length of 4,250 feet, which was utilized to provide passage through a mountain. Alexandria had tunnels to supply water from the Nile, while the Romans, Peruvians, and Mexicans carried supplies of water for long distances by aqueducts and through underground passages.

Among the most noted European tunnels of modern times may be mentioned those of Simplon, Saint Gothard, Arlberg, and Mont Cenis.

The Mont Cenis tunnel is seven miles long and the Saint Gothard tunnel is over nine miles, both piercing the European Alps. The American tunnels include one at Port Huron, Mich., passing under the Saint Clair River; the Pennsylvania Railroad tunnel under the Hudson River, connecting New Jersey with New York City; one in Chicago under Lake Michigan, serving to secure a supply of city water from a distance of several miles; and one under Saint Louis, affording connection between the union depot and the Eads's Bridge across the Mississippi. The Great Divide tunnel at Hagerman Pass, Colo., was opened for traffic in 1893. It pierces the Rocky Mountains through solid gray granite. The length is 9,393 feet; height above sea level, 10,-800 feet; and cost, \$1,125,000. It is so called because the water falling on the east side of the mountain flows toward the Atlantic and that of the west side, toward the Pacific. The cut through the Cascade Mountains, on the line of the Northern Pacific Railroad, west of Kalispel, Mont., is the greatest railroad tunnel in America. It is about three miles long and cost \$4,-250,000. Aside from saving time and distance in passing the mountain system, the tunnel avoids keeping open for seven months in the year passes where snow often falls to an extraordinary depth.

Another class of tunnels includes those known as *subways*, which are constructed in the larger cities to furnish means of rapid transit. The largest of these in North America is the subway of New York City, which extends from the Battery to the Bronx, furnishing communication by a system of double tracks, and an extension is operated to Brooklyn by a tunnel under the East River. Boston and Philadelphia likewise have subways. The most noted subways of Europe are in London, Berlin, and Paris. See New York, Subhead Bridges; Simplon Tunnel.

TUNNY (tŭn'ny), a class of fish belonging to the mackerel family, including a number of important species. The American tunny ranges from New Jersey to Nova Scotia. It is four to twelve feet long, is dark brown above and lighter below, and is valuable for its flesh and the oil it yields. An allied species is common to the vicinity of the West Indies, which is also a valuable food fish. The most important species of tunny, known as the long-finned albacore, is found in the Mediterranean and off the coast of Western Europe. It ranges in length from eight to twenty feet, large specimens weighing from 800 to 1,200 pounds. The upper part has a dark blue color and the lower side has a silky color with dusky spots. The flesh, which is of a pink hue, is highly esteemed, both fresh and preserved. The tunny fisheries of the Mediterranean have been important since the early history of man, and the most extensive catches are on the coasts of Sicily, Sardinia, Italy, Spain, and Turkey.

TUPPER (tup'per), Sir Charles, Canadian statesman, born in Amherst, Nova Scotia, July 2, 1821. After attending the public schools of Nova Scotia, he studied medicine at Edinburgh, Scotland, and was granted a degree in 1843. He was a member of the executive council and provincial

secretary of Nova Scotia from 1857 to 1860, and in 1864 became Prime Minister. but retired from office when his Province was united with the Canadian federation, in 1867. In 1870 he was made a member of the Privy Council of the Dominion of Canada and in 1884 became High



SIR CHARLES TUPPER.

Commissioner for Canada in London. His services in negotiating the fisheries treaty with the United States in 1888 caused him to be made a baronet. He retired from the High Commissionership in 1896 and, returning to America, became Premier of the Dominion, but was soon succeeded by Wilfred Laurier. In 1900 he was defeated in the election by Cape Breton, where he had been supported for forty years, and subsequently retired from public life. Acadia College and Cambridge University granted him degrees. He died Oct. 30, 1915.

TUPPER, Martin Farquhar, inventor and author, born in London, England, July 17, 1810; died Nov. 29, 1889. He studied at Charterhouse, London, graduated from Oxford University in 1831, and in 1835 was admitted to the bar. After conducting a few cases at law, he gave up that profession and engaged in literary work. In 1845 he was admitted to the Royal Society. He made two visits to America, in 1851 and 1876. The most popular of his writings is "Proverbial Philosophy," which appeared in three series in the period between 1838 and 1867, and was the means of netting him a profit of about \$90,000. His inventions include glass screw tops to bottles, safety horseshoes, and several others, but they were not of material success. His writings include "Three Hundred Sonnets," "Hymns for all Nations," "My Life as an Author," "Ballads for the Times," and "Our Canadian Dominion."
TURANIAN (tū-rā'nĭ-an), a term applied

TURANIAN (tū-rā'nĭ-an), a term applied by some writers to an extensive branch of the Eurasian languages. It was first used by the Persians, who called their own country Iran and the countries lying toward the north Turan; hence, the people of the latter became known as Turanians. Originally the term included all speech of Asiatic origin that is neither Aryan nor Semitic, but in later use it is practically synonymous with Ural-Altaic. In this wider sense it embraces the speech of the Bulgarians, Hungarians, Finns, and Lapps of Europe and the

2937

Turks or Tartars, Samoyeds, Manchus, and Mongols of Asia or Asiatic origin. These widely separated peoples speak dialects less closely connected than the Aryan and Semitic groups. This circumstance has led many writers to classify some as distinct languages, as, for instance, the Manchurian and Mongol tongues. It is noteworthy that a wide difference exists in the state of civilization, customs, and industries pursued by the several branches. The Samoyeds of Northern Asia are the lowest in the scale and the peoples in Europe belonging to this class are the most advanced, as the Hungarians and Finns. Both of the latter have a language of considerable culture, with a literature embracing songs, theology, history, poetry, law, geography, and other writings. The term Turanian, in its more limited application, is confined to those peoples who inhabit the Ural and Altai Mountain ranges and the neighboring country.

TURBAN (tûr'ban), the name of a covering for the head, worn extensively in Asia and North Africa. In most countries it is in the form of a roll of cloth twisted around a cap. The turban worn by a sultan is ornamented with gems and it is looked after by an officer called the dulbend aga. Green turbans are usually worn by emirs and the grand vizier has decorations of heron feathers in his turban. More recently the Turks generally abandoned it for the

fez or red skullcap.

TURBINE (tûr'bin), a water wheel in which advantage is taken of the reaction of the escap-Turbines are constructed in a great variety of forms and their axis of rotation may be either vertical or horizontal. In most cases the turbine wheel is on a vertical shaft and moves within a close-fitting box. Such a turbine is called an inside wheel, but if it is on the outside of the curved guide it is termed an outside wheel. A vertical or oblique pipe or chute, called the penstock, admits the water to the wheel, which is provided with bucket floats that point in the same direction. The water enters through openings between fixed curved guides, so inclined to the buckets that on leaving the guides it strikes the buckets in the most advantageous direction. The wheel is driven partly by the momentum of the moving water and partly by the weight of the water in the buckets. In addition to this, on running out of the buckets, the reaction of the escaping stream aids in turning the wheel. Turbines of the highest capacity are operated at Niagara Falls, both in Canada and the United States, and the construction is such that the weight of the wheel is supported by the upward pressure of the water against a disk in the top of the case inclosing the wheel.

TURBOT (tûr'but), a species of the flatfishes, the most valuable of the genus. It is broad and scaleless and has conical tubercles on the upper side. The dorsal fin extends from the upper lip to the tail. Its eyes are on the left side, which has a brownish color, and the right or lower side is white. The spotted turbot found off the Atlantic coast of North America, sometimes called the plaice and the water flounder, weighs 15 to 25 pounds. It is about twice as long as it is wide. The common turbot found in the North Sea and other waters of Western Europe attains a weight of 60 to 90 pounds, but specimens weighing 180 pounds have been caught. Like other flatfishes, it swims near the bottom, the best turbot fisheries being near deep shores. The flesh is white and delicate and has

been in high esteem from antiquity.

TURENNE (tü-ren'), Henri de la Tour d'Auvergne, Count of, eminent military commander, born in Sedan, France, Sept. 11, 1611; died July 27, 1675. He was the second son of Henry Bouillon, Prince of Sedan, and of Elizabeth, daughter of William the Silent, Stadtholder of Holland. In 1615 he was sent to Holland for military training under his uncle, Maurice of Nassau, who was then the most eminent soldier of Europe. He entered the army of France in 1630, serving in Germany and North Italy, and in 1642 was made a marshal and given command of the Rhine in the Thirty Years' War. The Bavarians under General Mercy defeated him at Marienthal, but in 1645 he won the famous Battle of Nordlingen, in which Mercy was slain and the close of the war was hastened. The civil wars of the Fronde soon followed, Turenne and Condé being on opposite sides, but the latter was defeated in a series of battles and was obliged to leave France after his defeat of the Dunes in 1658. Turenne was soon after created marshal general of the armies of France by Louis XIV.

When France and Spain again took up arms, in 1667, he invaded Holland with an army of French, but was compelled to retire because the Dutch cut their dikes and flooded the country. In 1672 he invaded Westphalia for the purpose of opposing Montecuccoli, the eminent Austrian general who had succeeded the Elector of Brandenburg in command of the imperial army, but his campaign in Germany proved less fortunate for him. He first devastated a large part of the Palatinate and met his opponent in battle at Salzbach on July 27, 1675, but was struck by a bullet while in the act of leading his troops to the attack. Turenne ranks next to Napoleon as a military leader of France. He was buried with distinguished honors in Paris, where several fine monuments have been erected to commemorate his life and military achievements. Turenne was educated as a Protestant, but Bossuet influenced him to become a Catholic in 1668.

TURGENIEFF (toor-ge'nyef), Ivan Sergeyevitch, celebrated novelist, born in Orel, Russia, Nov. 9, 1818; died in Bougival, France, Sept. 3, 1883. His family removed to Moscow in 1828, where he took a university course, and subsequently studied in Saint Petersburg and Berlin, Germany. He returned to Russia from Berlin in 1841, devoting his time largely to lit-

2938

erary contributions to several periodicals, and for some time held a government position at Saint Petersburg. He was liberal and progressive in advocating civil reforms and was imprisoned and afterward banished, but in 1854 regained his freedom in Russia. In 1863 he removed to Baden, Germany, and later to Paris. and remained in France most of the time until his death. He wrote in Russian, German, and French, but there have been a number of translations into the English and other languages. His productions are very numerous and include, besides novels of a high character, a number of writings devoted to the life of Russian peasantry, history, and civil reforms. Among those best known are "Tales of a Sportsman," "Nest of Nobles," "Fathers and Sons," "Dimitri Rudin," "Spring Floods," "Journal of a Useless Man," and "Virgin Soil." The last mentioned is one of the most valuable works treating of Russian peasantry and the Nihilist movement.

TURGOT (tür-go'), Anne Robert Jacques, statesman and economist, born in Paris, France, May 10, 1727; died there March 18, 1781. He descended from an ancient family of Normandy, which included a number of eminent clergymen, and was educated for the church, studying at the Seminary of Saint Sulpice and at the Sorbonne. In 1749 he was prior of the Sorbonne, an office conferred on some distinguished student, and soon after became an advocate. He was given official charge of the Limousin province in 1761, where he introduced the cultivation of the potato, improved bridges and highways, and greatly extended commercial and industrial enterprises. Louis XVI. appointed him minister of marine in 1774, but in the same year promoted him to the ministry of finance. His administration was of vast financial value to France, since he placed the country on a substantial basis, promoted public works, encouraged improvement in agriculture, reduced taxation, and provided for the importation of grain free of duty.

The reforms of Turgot were supported by the larger mass of people, but met with opposition among the statesmen and nobles, and the king finally yielded to his enemies and dismissed him from office in 1776. It is quite probable that the French Revolution would have been averted had the reforms of Turgot been carried forward. After retiring from office, he devoted himself to study of ancient poets and physical science, and in 1777 became vice director of the Academy of Inscriptions. Franklin and Adam Smith were among his personal friends. It was Turgot who said of Franklin, "He snatched the thunderbolt from heaven, and the scepter from tyrants." His writings include "Reflections upon the Formation and Distribution of Riches," "Benefits Conferred by the Christian Religion upon Mankind,' "Memoirs on the American War," "Usury," "Historical Progress of the Human Mind." He contributed a number of articles to the "Encyclopedie."

TURIN (tū'rĭn), a city of northern Italy, in Piedmont, on the Po River, 76 miles southwest of Milan. The surrounding region is noted for its fertility and toward the west are the foothills of the Alps, which include Mont La Superga, height 2,407 feet. Turin is a city of great beauty, having broad and regular streets and large squares and public gardens. The Cathedral of Saint John the Baptist dates from the 15th century and is a fine specimen of cruciform renaissance architecture. It has many other churches of fine structure, numerous hospitals, schools, convents, and government buildings. The Madama Palace, erected by William of Montferrat in the 13th century, is an interesting building, and the extensive royal palace dating from the 17th century is likewise remarkable for its beauty. The University of Turin, founded by Lodovico di Acaja in 1400, is one of the largest educational institutions of Southern Europe. It has departments of medicine, literature, surgery, jurisprudence, philosophy, physics, mathematics, and sciences. In connection with it is a fine botanical garden, an observatory, a museum, and an extensive library. It is attended by 2,375 students.

The city has numerous pleasant promenades, several fine monuments and statues, and modern municipal facilities. Most of the streets are well lighted with gas and electricity. It has stone and asphalt pavements, waterworks, sewerage, and an extensive system of rapid transit. Among the manufactures are jewelry, silk and woolen goods, pianos, paper, pottery, porcelain, earthenware, machinery, ironware, vehicles, clothing, scientific instruments, and spirituous liquors. This is the center of a large trade in grain, fruit, wine, and merchandise. The central offices of the North Italy Railway are at Turin, which has a fine central depot and extensive machine shops.

Turin was so named from the Taurini, a Ligurian tribe which lived there at an early period. Its first mention in history is in connection with Hannibal, by whom it was captured at the time he crossed the Alps into Italy. The Romans made it a colony in 166 B.C., but at the decline of the empire it became a Lombard city, and long served as the capital of a Lombard duchy. It became the seat of the Duke of Susa in the time of Charlemagne, and the descendants from that line ruled it until 1032, when it became a possession of the house of Savoy. Subsequently it passed to the French, who held it until 1815, when it was restored to the house of Savoy. It was the capital of Italy from 1859 to 1865, yielding that distinction to Rome in the latter year. Turin has grown with remarkable rapidity within the last fifty years, which is due largely to its extensive railroad and manufacturing enterprises. Population, 1916, 458,985.

TURKESTAN (toor-kes-tan'), meaning the country of the Turks, an extensive scope of territory of Western Asia. It is bounded on the north by Siberia, east by China, south by Tibet,

India, Afghanistan, and Persia, and west by the Caspian Sea. The region is divided into two portions by the tableland of Pamir, an elevated ridge about 15,000 feet high, thus forming Eastern Turkestan and Western Turkestan. It is inhabited by a mixture of Asiatic peoples, though the population includes chiefly Arvans and Turanians. The slopes of the Pamir are occupied by a purely Aryan population. On the slopes of the Thian Shan Mountains are extensive settlements of Kirghiz, while the northwestern part is occupied by Kalmucks, the central part by Turks and Persians, and the northeastern part by Mongols. The language is largely a Turkish dialect. but is mixed to a considerable extent with Chinese and Persian words.

Much of the history of Asia is connected with Turkestan. A large part of the western region belonged to Persia in the early historic period and many of the principal cities were founded while it was under Persian control. Alexander the Great annexed it along with Persia to Macedonia, but it was conquered by the Arabs in the With the decline of the Arab 8th century. caliphs, it became divided into small possessions and was finally overrun by Genghis Khan and his Mongol forces, but on his death came under the government of his son, Jagatai. Timour succeeded the latter and in his reign of 35 years Turkestan developed marked influence as the center of an immense empire, which extended from Burma to the Danube and from Siberia to the Persian Gulf. The period of Timour's reign may be called the golden age of Turkestan, since he brought skilled artisans and learned men to its cities, constructed internal improvements, and enriched the country by vast spoils of war. His death was followed by a division of the empire into various independent states, which, in the latter part of the 15th century, began to war against each other. Its subsequent history is that of petty wars and internal dissensions until the eastern portion became a part of China and the western portion was annexed to Russia.

Eastern Turkestan, or Chinese Turkestan, is bounded on the north by the Thian Shan Mountains, east by China, south by Tibet and India, and west by the Pamir tableland. The eastern part merges into the Desert of Gobi and in the central part is the Tarim Desert. Practically all of the region lies within the basin of the Tarim River, which rises in the Kakakorum Mountains and flows into the inland Lake Lob-nor. Its principal tributary from the south is the Khotan River. Much of the surface is of a desolate and unattractive character, including numerous salt marshes and desert wastes, but along the streams are considerable belts of fertile land. The mountain districts are rich in minerals, including gold, silver, copper, lead, agate, iron, sulphur, jasper, and asbestos. Extensive deposits of salt prevail in the vicinity of Lob-nor.

Rice, cotton, wheat, barley, corn, flax, tobacco, and fruits comprise the chief soil products.

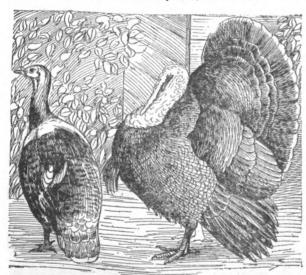
Large tracts have been redeemed for cultivation by irrigating the lands from streams and mountain snows. Pastoral life is followed by many of the people, the live stock including horses. buffaloes, camels, sheep, and cattle. It has manufactures of carpets, linens, cotton and silk goods, jewelry, silver and gold wares, clothing. and utensils. Most of the unproductive regions are frequented by nomadic tribes, who find pasturage for their herds in the valleys. The country exports cereals, fruits, live stock, minerals, and merchandise. Mohammedanism is the chief religion. Numerous schools and colleges are maintained in the larger towns. Russia claimed a protectorate over a large part of the region in 1871, but ceded its claims to China in 1879. Turkish is the common language of the people. Kashgar and Yarkand are the chief towns. Population, 615,500.

Western Turkestan, or Russian Turkestan, is bounded on the north by Siberia, east by the Pamir tableland, south by Afghanistan and Persia, and west by the Caspian Sea. It comprises the Turkoman Steppes, the Trans-Caspian districts, the khanates of Khiva and Bokhara, and the oasis of Merv. The Oxus and Daria (Jaxartes) are the chief rivers, both rising in the southeastern part and flowing toward the northwest into the Aral Sea. A great variety of aspects is presented by the surface and climatic conditions, ranging from desert wastes to regions of remarkable fertility and productiveness. It has deposits of coal, petroleum, marble, gypsum, iron, lead, and kaolin, and considerable wealth in silver, gold, and graphite. The manufacturing enterprises yield considerable wealth in the form of linens, machinery, hardware, woolen and silk textiles, furniture, soap, spirituous liquors, leather, carpets, and firearms. Agriculture, fruit growing, mining, stock raising, and commerce are equally important industries. It has a large caravan and railroad trade.

The Trans-Caspian Railroad penetrates from Krasnovodsk, on the Caspian, through the heart of Western Turkestan, thus providing excellent transportation facilities. It has many thriving cities, among them Merv, Bokhara, Samarkand, and Tashkend. Western Turkestan is a possession of Russia. A Russian invasion occurred in 1850, when they took Khulm and Balkh, and in 1859 annexed Kunduz. Subsequently they annexed Tashkend, Bokhara, and Merv, and since 1881 the entire region has been under Muscovite control. Russian occupation has been of immense value in that it has fostered railroad building, developed the material resources, and given to the country a more stable and beneficent government. Schools and colleges have been established in all the towns of importance. Turkish is the chief language and Mohammedan is the principal religion, but many of the inhabitants belong to the Greek, Roman, and Protestant churches. The region of Turkestan now under Russian control has an area of 1,750,000 square miles and a population of 8,525,000. Tashkend and Bokhara are the principal seats of governmental influence.

TURKEY (tûr'ky), a large bird native to North America. It was first brought to Europe when Hernando Cortez returned to Spain from his expedition of discovery in the 16th century. Only two species are known, the common turkey and the Honduras turkey. The common turkey was distributed formerly in a wild state from the Atlantic to the Rocky Mountains, extending southward to the Isthmus of Panama, but at present is found only in some sections of the southern and western parts of the continent. The bare head and neck are peculiarly marked by a number of fleshy tubercles, and the male has a tuft of hair hanging from the breast. The weight of a full-grown wild gobbler is 15 to 22 pounds, the hen being somewhat smaller, but the domestic turkey is not so large and its flesh is less finely flavored.

Turkeys in the wild state frequent only the timber districts, where they live in flocks, feeding on seeds, insects, berries, frogs, lizards, and tender plants. They nest under a bush or in tall grass, line the nest with leaves or feathers, and usually have about twelve cream-colored eggs. The plumage is a golden bronze, banded with black, and diversified by violet and greenish markings. In the domestic state the turkey is highly useful for its flesh and eggs and is reared extensively along with other poultry. It is now



TURKEY HEN.

TURKEY COCK.

an important domestic fowl in Europe and other countries as well as in North America. The hen lays from ten to fifteen eggs twice a year, but the eggs are mostly incubated by female chickens, though also by the turkey hen. Young turkeys are quite tender, being easily overcome by the hot sun or cold rains, although the adult is

quite hardy. The *Honduras turkey*, an allied species, is native to tropical America and the West Indies. It is somewhat smaller than the common turkey, but has more beautiful plumage. The neck is less wattled and it has eyelike spots on the tail feathers.

TURKEY, or Ottoman Empire, a country in Southeastern Europe and Western Asia, lying north and east of the Mcditerranean Sea. In addition it has extensive possessions in Africa and receives tribute from a number of dependencies in Europe. The latter are practically independent in their government and their dependence upon Turkey is merely nominal, including only the payment of a tribute annually to the Sultan. Some of the boundaries are not definitely fixed and as a whole they are very irregular, owing to natural barriers, such as extensive ranges of mountains and numerous inlets from the Mediterranean and the Black Sea. The following table contains an exhibit of the territorial possessions, together with the area and population, prior to the war of 1913:

NATIONAL DOMAIN.		POPULATION.
Europe	65,325	6,330,200
Africa	405,800	1,000,000
Asia	682,200	16,898,700
DEPENDENCIES.		
Samos	180	54,440
Crete		310,400
Cyprus	3,710	237,000
Egypt	400,000	9,821,100
m-4-1	1 560 545	24 651 940

EUROPEAN TURKEY. Turkey in Europe extends

from the Adriatic to the Black Sea and embraces fully one-third of the Balkan Peninsula. It is bounded on the north by Montenegro, Austria-Hungary, Servia, and Bulgaria; east by the Black Sea and the Bosporus; south by the Sea of Marmora, the Strait of Dardanelles, the Aegean Sea, Greece, and the Ionian Sea; and west by the Adriatic Sea and Montenegro. The Dardanelles, the Sea of Marmora, and the Bosporus separate it from Asiatic Turkey. The Pindus Mountains extend through the western part, the chain running almost parallel to the Asiatic, while in the east central part are the Rhodope Mountains, and along the northern boundary are ranges of the Balkans. Transverse ranges extend from the principal groups and valleys of considerable fertility characterize many parts of the country. Most of the surface water flows into the Aegean Sea, which receives the Maritza, Vardar, and Struma rivers. The Drin, Ergent, and Vojutza rivers flow into the Adriatic. Among the many gulfs that indent the

Satisfy the many guns that indent the southern shore are the Salonica, Contessa, Lagos, and Saros, while the western shore is indented by the gulfs of Drin and Valona. These gulfs furnish good harbors and navigation facilities, and the Maritza is navigable in its lower course. The coastal plain of the Aegean Sea is a level region, and extensive valleys and

interior plains characterize many parts of the country. Lake Scutari, which extends into Montenegro, is a fine sheet of water. Other lakes include Ochrida, in Albania, and Takinos, in

ASIATIC TURKEY. Turkey in Asia includes all of Asia Minor and Palestine, extending east to Persia. It is bounded on the north by the Black Sea and Transcaucasia, east by Persia and Arabia, south by Arabia and the Mediterranean, and west by the Mediterranean and the Aegean seas. A narrow strip of land belonging to Turkey extends between Arabia and the Persian Gulf, and another strip is surrounded by Arabia, the Gulf of Aden, the Red Sea, Egypt, and the Mediterranean. The latter is about 160 miles wide and 1,600 miles long. It includes the provinces of Yemen and Hadjaz. The country as a whole has an extended coast line, which is broken by many gulfs and bays, and off its shores are numerous islands, most of which lie in the Aegean Sea.

The surface of Asiatic Turkey is greatly diversified. A large part of Asia Minor is a mountainous plateau, including the Taurus and the Anti-Taurus mountains, the Lebanon and Anti-Lebanon mountains, and numerous articulated spurs and ranges. Barren deserts, elevated highlands, fertile plains, and productive valleys make up the region lying toward the East. In the eastern part is the famous valley of the Euphrates, which receives the Tigris, and the drainage is carried through the Shat-el-Arab into the Persian Gulf. The Kizil Irmak and the Sakaria drain a large portion of the northern section into the Black Sea. Palestine is drained chiefly by the Jordan and the El Araba into the Dead Sea, which has no visible outlet. Many lakes with salty water are distributed throughout the central and eastern parts, of which Lake Van, near the border of Persia, is the most important.

AFRICAN TURKEY. The distinctly Turkish possessions in Africa are confined to Tripoli, which includes Fezzan and Barca. It is governed from the city of Tripoli, on the Mediterranean, while Bengazi, on the Gulf of Sidra, is the capital of the vilayet of Barca. Egypt is nominally a possession of Turkey, but the government is exercised largely under British influence. This is true likewise of Cyprus, a large island in the Mediterranean.

CLIMATE. Few countries have climatic conditions that vary as greatly as those of the Ottoman Empire, although no part of the country is extremely cold. The regions bordering on the Aegean Sea have a subtropical climate, with pleasant summers and mild winters, suitable for the cultivation of cotton and fruits. Much of the interior is cut off from the tempering influences of the sea by lofty mountains, and in these sections the extremes are very marked, ranging from excessive heat in the summer to a temperature below zero in the winter. The mean temperature at Constantinople is 43° in January

and 73° in July; but in the eastern part, especially in the deserts, the summer heat rises to 108°, and even to 120°. Rainfall is heaviest on the Adriatic coast and gradually decreases toward the east, where it is very scant. The drier sections are in the east central part, in the region of the saline lakes, and in the southern extension along the Red Sea and the Persian Gulf. Another dry belt extends throughout the southern part of the African possessions, especially in Fezzan and the Libyan Desert.

MINING. Few countries have mineral resources more extensive or diversified than Turkey, but the mining industry has not been developed materially. The vilayet of Salonica, on the northern shore of the Aegean Sea, is especially rich in manganese. Asia Minor has valuable deposits of lead, silver, coal, copper, antimony, and chrome. Meerschaum is obtained in large quantities at Eski-Shehr, in Asia Minor. The valley of the Tigris has an extensive field of natural gas and petroleum. Vast quantities of salt are found in the east central part, but they are worked to a very limited extent. Kaolin is obtained in the island of Rhodes. The government gives encouragement to the exportation of minerals by paying a small royalty to native operators, but the mines worked are chiefly in the hands of foreigners.

AGRICULTURE. Farming and cattle raising are the chief industries, but both are in a primitive condition. In all sections of the empire the people are oppressed by taxation, land monopoly, poorly improved roads, and a low standard of civilization. Practically all of the land is owned by the church or the crown, making it necessary for the peasants to pay rent, many of whom are overwhelmed with poverty. However, the country has a comparatively large area of fertile lands suitable for the cultivation of rice, cotton, maize, barley, millet, rye, wheat, and fruits. Other crops include tobacco, buckwheat, madder, flax, opium, and hemp. Much attention is given to the culture of silk, both in the possessions of Europe and Asia, but more particularly in Asia Minor. The cultivation of beet roots has been introduced through the establishment of stations by Germans, who likewise promote the cultivation of hops, asparagus, and other plants. Attar of roses is obtained in large quantities in Asia Minor and Palestine, coffee is produced in Yemen, and the vine is important in many parts of the empire. Mesopotamia, once highly fertile, is now largely a barren waste on account of the irrigation works having been neglected. However, the government has restored some of the dams and is promoting interest in the cultivation of rice, dates, and other crops.

Stock raising is comparatively insignificant when considered in the light of development in America and Western Europe. Swine are grown to a very limited extent, owing to the fact that both the Jews and the Mohammedans are adverse to the use of pork. Sheep and goats are

reared in large numbers and both are important as meat-producing animals, while the milk of goats is used extensively for household purposes. Large interests are vested in stock raising in the western and central parts, where a good grade of cattle is grown. Other domestic animals include horses, poultry, and camels, the last mentioned being used chiefly in the possessions of Africa and Asia.

MANUFACTURES. It is estimated that Turkey has woodland aggregating 21,000,000 acres, about one-seventh of which is in European Turkey. These woodlands supply considerable material for export and construction purposes. Most of the manufacturing is of a primitive character, such as hand-loom weaving and the transforming of brass and copper into household utensils by artisans. Steam machinery is employed to a considerable extent in the manufacture of cotton and silk textiles, especially at Salonica and Constantinople. Among the general manufactures are carpets, attar of roses, silk goods, cotton and woolen textiles, tobacco products, furniture, glassware, cured fish, and leather products. Formerly fez caps were made in sufficient quantity to supply the home demand, but in this product, as well as in carpets and Turkish leather and yarns, there is considerable competition with the products imported. Mother-of-pearl and sponges of excellent quality are obtained in large quantities and enter to a considerable extent into the

manufacturing enterprises.

COMMERCE AND TRANSPORTATION. trade is burdened by taxes that are imposed in transporting from one province to another. The government charges both export and import duties as a means of raising revenue. According to the official reports, the imports greatly exceed the exports, but it is likely that the value of both is considerably underestimated for the purpose of benefiting the shippers. A large share of the internal trade is in the hands of Armenians, Greeks, and Jews. Among the exports are raisins, opium, coffee, carpets and rugs, woolen and silk textiles, tobacco, grain, hides, The imports include nuts, drugs, and fruits. textiles, sugar, petroleum, cereals, hats and fez caps, and machinery. The larger share of the foreign trade is with Great Britain, Austria-Hungary, Italy, Germany, and Russia, in the order named. The native Turks are unfriendly to the arts of conducting business and developing enterprises of the kind met with in Western Europe, and for this reason ancient methods are employed in practically every avenue of public and private business. Few highways have been improved, and the railroads do not exceed 3,950 German and Russian capitalists have franchises for the construction and operation of most of the railroads and telegraph lines. The country has 18,900 miles of telephone and 30,375 miles of telegraph wires. Much of the interior trade across the deserts and highlands is carried by caravans, though there is considerable traffic by navigation on the Euphrates and Tigris and on the adjacent seas. The mercantile marine embraces only 110 steamers and 925 sailing vessels. Most of the foreign trade is carried by vessels belonging to the countries of Western

GOVERNMENT. Turkey is governed on the basis of a theocratic monarchy, with absolute executive and religious authority vested in the Sultan, who claims succession from the caliphs. A constitution was granted in 1908, but it retains so many features of the former absolute government that it cannot be compared with the fundamental laws upon which limited monarchies are based. Though legislative and executive authority is vested largely in the sovereign, it is exercised mainly by two high dignitaries, one the Grand Vizier, representing the temporal government, and the other, the Sheikh ul-Islam, being the head of the church. Both receive their appointment from the Sultan with the nominal concurrence of the Ulema, a body comprising the clergy and high functionaries of the law. The empire is divided into governments or vilayets, which are subdivided into provinces or sanjaks, and these are again divided into districts or kazas. The Koran remains the chief inspiration. In the administration of affairs the Sultan is assisted by the Grand Vizier, who is appointed by the Sultan, and this officer is aided by a cabinet of ten ministers. Accounts are kept in the lira and the pound, the former having a value of 36 cents and the latter, of \$4.40.

Military service is compulsory on all Mohammedans who have reached the age of twenty years, and all others are exempt under the payment of a small annual exemption tax. army includes 700,625 men and officers, and the war footing is estimated at 950,000. Turkey has no powerful navy, most of the vessels being of remote construction and intended for local defense. Mauser rifles are used in the army, and the organization and discipline are largely on the plan adopted by German officials. Land and property taxes; excises on spirits, salt, and tobacco; and customs are the chief sources of revenue. Foreign affairs are administered very inefficiently, frequently without regard to international law, and the country is held together largely through the jealousy of foreign powers that seek to attain the preëminence of influence. "The Sick Man of Europe" is the term commonly used in referring to the Sultan, owing to

the instability of his government.

Education. Scarcely any progress has been made in education, and comparatively few of the adult population are able to read and write Those who enjoy educational advantages belong to the wealthy class. No reliable statistics upon the state of education have been published. Since the Koran commends the instruction of youth, free public schools are maintained under government grants, though the courses and the methods of teaching are primitive. The number of elementary schools is placed at 2,180. A number of colleges for higher education are connected with the mosques. Many missionary schools are maintained, and the parochial schools and Christian seminaries are quite numerous. The number of mosques in the empire is placed at 2,125, of which about one-sixth are in Constantinople.

INHABITANTS. The population of European Turkey is made up largely of Greeks, Bulgars, Turks, and Albanians, though other races are represented. In Asiatic Turkey the Turks are in a great majority, but the inhabitants include many Arabs, Armenians, Circassians, Greeks, Kurds, and Jews. Not more than one-half of the people are Mohammedans, the remainder being Armenians, Jews, Orthodox Greeks, Roman Catholics, and Protestant Christians. Mohammedanism is the national religion, but all faiths are tolerated, though not with the spirit of liberality.

Constantinople, on the Bosporus, in Europe, is the capital and largest city of the Ottoman Empire. Adrianople, Monastir, Salonica, and Janiva are other important cities in European Turkey. Among the chief cities of Asiatic Turkey are Damascus, Jerusalem, Beyrout, Rhodes, Tokat, Balikesri, Smyrna, Bagdad, Aleppo, and Scutari. Tripoli, Alexandria, Cairo, Bengazi, and Port Said are the leading cities of African

Turkey.

LANGUAGE AND LITERATURE. The Turkish language is a branch of the Turanian family of tongues and is allied to the dialect spoken by the Finns and the Hungarians Geographically it belongs to a strip of country about 300 miles wide, which extends from the Adriatic Sea eastward to the western border of Manchuria. The western branch is generally known as Osmanli, and is enriched by words taken from the poetry and history of Persia. It has been influenced to a considerable extent by the Arabic. During the Christian era it came to be modified by the introduction of Greek and European words and modes of expression. Eastern Turkish is the name applied to the language spoken by the Turkish tribes that form a large element in the region lying east of Asia Minor. While the Turks have a considerable literature, many of their works have been translated from the Arabic, Persian, and European languages. A majority of the original writings are devoted largely to comments on the Koran, Turkish law, history, geography, astronomy, and Turanian philology. Ahmed Vefik Pasha (died in 1893) published a dictionary of the Turkish language, and may be said to have thus rendered a service of great value to his race. While the modern writers are not numerous, they include the historian Javdet Pasha, the poet Jevad Pasha, the literary critic Ebuzzia Tevfik, and the essayist Muallim Naji.

HISTORY. The Turkish Empire was founded by the Ottoman Turks, who occupied a region of the Altai Mountains and in the 6th century A. D. began to move westward. They were subdued by the Saracens in the 8th century and reduced to slavery, but learned from their conquerors better arts of war and embraced the Mohammedan religion. In the 13th century they formed an alliance with the Seljuk Turks in a war against the Mongols, receiving in return for their services a grant of land in Asia Minor. Othman or Osman, an Oghuzian Turkoman, became Emir of Iconium in Asia Minor after the death of the Seljuk Sultan, and proclaimed himself Sultan in 1300. He conquered Nicaea and other districts, thus founding the empire of the Ottoman Turks in the region formerly occupied by the Saracens, Mongols, and Seljuks, and at his death, in 1326, was succeeded by his son,

The second son of Orkhan succeeded to the throne as Amurath I, in 1360, and the following year captured Adrianople and made it the capital of European Turkey. His successors added considerable territory in Europe, and Mohammed II. finally conquered the Byzantine Empire by capturing Constantinople on May 29, 1453. The city has since been the seat of the Sublime Porte or Turkish government. Later Mohammed added Bosnia, Albania, Servia, and Greece to the Turkish Empire, and his grandson, Selim I., succeeded to the throne in 1517 and conquered Syria and Egypt. Turkey reached its greatest power and military importance under Solyman II., who reigned from 1519 to 1566. He captured Rhodes in 1523, conquered half of Hungary in 1526, and made Mesopotamia, Bagdad, Georgia and Moldavia tributary. His march into Europe was unimpeded by formidable resistance until he came in contact with Charles V. of Germany, who defeated him with great loss at Vienna in 1529. Since then there has been a continuous decline in Turkish power.

The allied fleets of Venice and Spain defeated the Ottoman fleet in the Battle of Lepanto, in 1571, thus destroying its naval importance, and a second defeat was administered to the Turks at Vienna in 1683 by the German army under Montecuccoli. Subsequently they were defeated by Sobieski at Vienna and by Prince Eugene at Zenta, in 1697. In the reign of Catherine II. of Russia, the Russian army under Romanzoff defeated the Turks in various battles in the Crimea, and by the peace treaty of 1774 Turkey lost the Crimea and a large region now included as territory of southern Russia. Napoleon deprived the Turks of Egypt in 1799, but that region was restored to the Sultan by English intervention in 1800. Russia, demanding a more distinct protectorate over the Christians in Turkey, soon after made consecutive additions of Turkish territory by annexing Moldavia, Bessarabia, and

the mouth of the Danube.

In 1821 the Greeks began a war for independence, and the cruelties perpetrated by the Turks upon Greek Christians finally induced Russia, France, and Great Britain to intervene. The

allied fleets of the three nations defeated the Turks in a naval battle at Navarino on Oct. 20, 1827, and two years later the independence of Greece was recognized. In the meantime the Janizaries had revolted and were massacred without mercy at Constantinople in 1826. Mehemet Ali, Pasha of Egypt, revolted against the Sultan in 1831, but the overthrow of Turkey was averted by the intervention of Russia in 1833, and in 1840 Turkey was admitted among the European states as a treaty power. In 1853 the Crimean War broke out, in which Russia was pitted against Turkey, but the latter was assisted by France and England. It terminated favorably to the allied armies and by the treaty at Paris on March 30, 1856, Russia lost Wallachia, Moldavia, and other frontier territories.

Bosnia and Herzegovina rebelled against Turkish misrule in 1875 and Bulgaria did likewise in 1876. In the armed contests that followed, Turkish soldiers massacred Christians without mercy, which caused all of Europe to become aroused. Russia declared war in April, 1877, granting at the same time permission to Austria to occupy Bosnia and Herzegovina. All the European nations manifested a willingness for Russian success, owing to the oppressive measures inflicted by Turkey upon the Christians, and Rumania joined Russia by declaring its independence on May 22, 1877. The Russians were successful at Kars, and completely annihilated the Turks at Plevna, compelling them soon after to accept the Treaty of San Stefano. The Treaty of Berlin, concluded on July 13, 1878, erected Bulgaria into a principality, annexed Bessarabia to Russia, empowered Austria to occupy Bosnia and Herzegovina, and declared the independence of Servia, Rumania, and Montenegro. In 1881 the French established a protectorate over Tunis, and in the same year Turkey ceded all of Thessaly and a part of Epirus to Greece. A revolution in Eastern Rumelia overthrew the government at Philippopolis, in 1885, and that province was annexed to Bulgaria. In 1897 a war broke out between Greece and Turkey, which proved disastrous to the former.

Abdul-Hamid II., born Sept. 22, 1842, succeeded to the throne on Aug. 31, 1876. His reign of 33 years was a disastrous period to the country, since it lost much in territory and prestige among the nations. Besides the Russo-Turkish War of 1877 and the Greco-Turkish War of 1897, many insurrections and massacres of Christians disturbed the peace of the country. In 1900 the relations between Turkey and the United States became somewhat unfriendly, owing to the former refusing to pay an indemnity of \$90,000 due American subjects, but the matter was adjusted after the United States warship Kearsarge and the training ship Dixie were sent to Smyrna. The Sultan sought to pacify his constituents and the dependencies in 1908 by restoring the constitution of 1876, but Bulgaria declared its independence and Austria

officially annexed Bosnia and Herzegovina. In 1909 an element known as the Young Turks revolted, captured Constantinople, and deposed the ruling sovereign. His brother, Mohammed Rechad Effendi, was proclaimed Sultan by the parliament as Mohammed V. Italy annexed Tripoli by proclamation in 1911. The Balkan War of 1913 caused Turkey to lose most of the territory in Europe. In 1914 it became involved in the Great European War as an ally of Germany and Austria-Hungary. See War. TURKEY BUZZARD. See Vulture.

TURKOMANS (tûr'kô-mans), a nomadic Tartar people of Asia, occupying the region bounded by the Caspian Sea and the Sea of Aral, Persia, Afghanistan, and the khanates of Bokhara and Khiva. They include numerous tribes or clans, each speaking a slightly different dialect, and may be said to constitute no single nation. Most of the nomadic tribes are warlike. They engage chiefly in agriculture and stock raising, but manufacture clothing and utensils.

TURKS, a numerous race of people of the Turanian family, supposed to have had their original seat in Turkestan. They were finally driven westward by the Mongolians, with whom they warred many centuries. Their possessions in Central Asia were entirely overrun by Genghis Khan in the 13th century. A portion of the Oghuzian Turkomans had been enslaved by the Seljuks, also a Turkish tribe, and, by allying themselves with the latter in a defensive war against the Mongols, they secured a foothold in Asia Minor, whence they spread over Persia and Syria. Othman or Osman founded the Ottoman Empire at the close of the 13th century, and his descendants are known as the Osmanli Turks. Other divisions of the Turks include the Turkomans, the Turkish nomads, the Tartars, and the Yakuts of the Lena River. The Turks are variously estimated, statisticians placing their numerical strength between 15,000,000 and 20,-000,000. The Ottoman Turks, most of whom are in Europe, show a closer resemblance to European people than to the Asiatic Turkish tribes, who more nearly resemble the Mongolians in the color of the skin and the contour of the face. Most Turks profess the Mohammedan faith, but those in Siberia are largely members of the Greek Catholic Church, and those in or near China are Buddhists. The Yakuts of Siberia profess Shamanism, which is closely related to fetichism. Though the dialects are somewhat different, they speak a language generally understood by the different classes. The Turkish tribes include the Bashkirs between the Irtish and the Volga and the Kalmucks resident in the region of the Don.

TURKS ISLANDS, an island group belonging to the Bahama chain. It is situated southeast of the Caicos Islands, about 90 miles north of Hayti. Both groups of islands are under the governor of Jamaica. The principal settlement is on the island of Grand Turk, which is about seven miles long and two miles wide. The two groups have an area of 224 square miles and a population of 4,740. Salt, sponges, and fruits are the principal products. Much of the surface is barren.

TURMERIC (tûr'mēr-ik), the tuberous root of a herbaceous, perennial plant belonging to the ginger family. The plant is native to Southern Asia and is cultivated extensively in that region and on the islands of the Indian Ocean. Turmeric is used as a condiment, in medicine, and as a dyestuff. It produces a yellow stain of great brightness, thus making it valuable in coloring varnishes and in preparing curry powder. Turmeric is cultivated in a light and wellwatered soil and the plant is propagated by offsets. An acre of fertile ground yields about 200 pounds of the product. The root is prepared for the market by cleaning and drying it in an oven. Long turmeric is a species that yields a root two or three inches long, and round turmeric has roots somewhat shorter but more bulky. The roots have a yellowish color.

TURNER (tûrn'er), Joseph Mallord William, landscape painter, born in London, England, April 23, 1775; died Dec. 19, 1851. He was the son of a barber, with whom he worked for some time, but in 1789 entered the Royal Academy as a student. His study and sketching were so successful that he was able to make numerous exhibits, and in 1799 became an associate of the Royal Academy, of which he was made a full member in 1802. His early paintings were largely landscapes in water colors, but on being made an academician he devoted himself to oil painting, and in the course of a half century exhibited 200 excellent productions. He traveled in France, Germany, Italy, Austria, and other countries of Europe for the purpose of coming in contact

with the works found in the principal galleries, his first tour being in 1802 and his second in 1804. His contributions to the Royal Academy include 259 pictures and about 19,000 drawings. All his pictures and sketches were bequeathed by his will to the nation and were placed in the Turner Gallery, a department of the National Gallery. He was buried in Saint Paul's, beside Sir Joshua Reynolds. Among his most noted paintings are "Falls of the Clyde," "Sun Rising Through Vapor,"

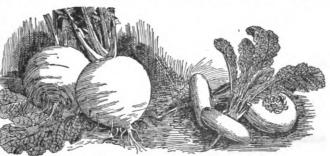
"Dutch Boats in a Gale," "Decline of the Carthaginian Empire," "Crossing the Brook,"
"Burial at Sea," "Approach to Venice," "Bridge of Sighs," and "Dido Building Carthage." He painted illustrations for poems by Scott, Rodgers, Byron, and others. John Ruskin wrote an exhaustive analysis of his works in "Modern Painters."

TURNER, Nat, Negro slave, born in South Hampton County, Virginia, about 1800; died

Nov. 11, 1831. He claimed from childhood to have been inspired to free his race. In 1828 he announced that he would receive a sign at the time the race was intended to rise and slay his enemies. He accepted the eclipse of the sun in February, 1831, as such a sign. In the summer of that year he organized a force of about fifty followers, with whom he went from house to house and killed 53 whites. Soon after he was confronted by a force of men and put to flight, but he was captured after hiding about six weeks. Afterward he was convicted of murder and hanged at Jerusalem, Va. Seventeen of his followers were captured and legally executed. The movement is commonly known as the Nat Turner Insurrection.

TURNER, Sharon, historian, born in London, England, Sept. 24, 1768; died Feb. 13, 1847. He studied for the law, but, after practicing a short time, he began to devote his attention to literature. His first celebrated work was published in 1805, entitled "History of the Anglo-Saxons." Although this production contains some imperfections, it gave the writer a permanent place in English literature. Other works from his pen include "History of Edward VIII.," "History of England from the Norman Conquest to 1509," "Reigns of Edward VI., Mary, and Elizabeth," and "Sacred History of the World."

TURNIP (tûr'nĭp), a biennial plant of the mustard family, which is cultivated for its fleshy, globular, edible root. It is a common vegetable in gardens and fields, being alike wholesome for culinary use and as a food for cattle. The seed is sown in temperate regions in June, usually broadcast, and the roots mature in ample time before the appearance of frost. In field culture the seeds are drilled by a machine in rows, thus



WHITE TURNIPS.

FLAT DUTCH TURNIPS.

facilitating cultivation by machinery. Many choice species have been obtained by propagation. Some are oblong rooted and others are globular, the latter being chiefly favored for table use. Among the chief species are the early Milan, white egg, early snow, flat Dutch, redtop, long white French, monarch Swede, and sweet German turnips. The Swedish turnip, or ruta-baga, is an allied plant and is cultivated mostly for cattle food. It has about 86 per cent.

of water, while the common turnips have 90 per cent. Turnips were a favorite vegetable in the times of the Greeks and Romans, but the species have been greatly increased in size and fleshi-

ness by careful culture.

TURPENTINE (tûr'pěn-tīn), an oleoresin exuding from several species of coniferous trees. The commercial product is secured chiefly from the pine tree. Crude turpentine flows naturally or from incisions made about five to six inches from the root of the tree to a height of about six feet. The several kinds of oil differ according to the species of trees from which they are derived. Turpentine has a density of about .87 and boils at about 162°. It is produced in large quantities in North Carolina, where it is obtained from the sap of the long-leaved pine. The larch tree yields the so-called Venice turpentine, a superior product. Strassburg turpentine is derived from the silver fir, German turpentine from the Scotch fir, and Canada turpentine from the balsam and several other species of fir. The trees yield the largest flow of sap in the spring, when the best grade is obtained, and the inferior quality comes from the hardened gum forming at the sides of the cut made by the hacker. Oil of turpentine is made by distilling the sap in a copper vat, which is connected with the worm of the still. The volatile parts rise and are condensed into spirits of turpentine, while the hard part remaining forms the resin of commerce employed in making soap. The oil, or spirits, of turpentine is used in medicine, in making varnishes and paints, and for dissolving resins.

TURPIE, David, statesman, born in Hamilton County, Ohio, July 8, 1829; died April 21, 1909. After attending the public schools, he began to study law, and in 1849 was admitted to practice at Logansport, Ind. In 1854 he became judge of the court of common pleas and was made judge of the circuit court in 1856, which office he resigned. He was an influential member of the State Legislature for several years. He was elected United States Senator in 1863 to fill a vacancy. From 1874 to 1875 he was speaker of the Indiana house of representatives and was made a commissioner to revise the laws of the State, serving in that capacity from 1878 to 1881. He was appointed United States district attorney for Indiana in 1886, but the following year again entered the United States Senate, and was reëlected to the same position in 1892. At the close of his term, in 1899, he was succeeded by Albert J. Beveridge. Turpie was an influential and able statesman and was a recognized leader of the Democrat

TURQUOISE (tûr-koiz'), a precious stone, having a blue or bluish-green color. It is composed essentially of a hydrated phosphate of alumina, with small proportion of oxide of iron and sulphate of copper, to which it owes its color. Turquoise is found in several regions of

Persia, where it is used for ornamenting arms, charms, and girdles. The best grades sold in the market are obtained in the mountains near Nishapur, Persia, but turquoise of a good quality is found in Mexico. It is so called because the mineral was first brought to Western Europe by way of Turkey. The finest turquoise gems are owned by the Shah of Persia, as only those of an inferior quality and less value are exported.

TURTLE (tûr't'1), the name applied commonly to a class of reptiles that frequent both land and water, but more properly to the large marine forms. In many instances it is used interchangeably with the word tortoise. In fact, turtle is the common name of both genera, and the term turtle has particular reference to the green turtle. This animal, when fully developed, is six to eight feet long and weighs from 700 to 850 pounds. The shell is usually smooth and colored greenish or olive. This reptile is highly valued for the delicacy of its flesh, which is used chiefly for turtle soup. It feeds on a marine plant known as turtle grass, but also on seaweed. Two species are well known, one of which inhabits the warm part of the Atlantic, and the other, the warmer waters of the Pacific. See Tortoise.

TURTLEDOVE, a class of birds that are allied to the domestic pigeons. They are somewhat smaller and more elegantly formed than the common doves. The Carolina turtledove is an American species. Its length is thirteen inches, with an alar extent of eighteen inches. It has the upper mandible slightly bent down, the tail is rounded, and it has a grayish color tinged with red. The common turtledove is distributed in many countries of Europe, Asia, and Africa. It is slightly smaller than the Carolina turtledove, being about ten inches long. It migrates to the warmer parts on the approach of winter, but returns to nest early in the spring. The nests are built of twigs, in which two creamwhite eggs are deposited in May. Both male and female alternate to sit on the nest. They are noted for their beautiful color of grayishbrown, for their cooing, and for the affection to their mate and the young. They pair for life. The collared turtledove is native to Palestine and North Africa. It is about ten inches in length. The general color is gray tinted with red and greenish-brown, the tail is short, and it has a black collar on the back of the neck. These birds are hunted for their flesh, for which large numbers are killed in autumn.

TUSCALOOSA (tŭs-kà-lōō'sà), a city in Alabama, county seat of Tuscaloosa County, on the Black Warrior River, 50 miles southwest of Birmingham. Communication is furnished by the Mobile and Ohio and the Queen and Crescent railroads. The surrounding country is fertile, producing tobacco, cotton, and cereals. In its vicinity are productive deposits of coal, iron ore, and fire clay. It has steamboat navigation

on the Black Warrior River, which is navigable to Tuscaloosa. The city was formerly the State capital, and is now the seat of a number of fine educational institutions, including the Tuscaloosa Female College, the Central Female College, and the Institute for Training Colored Ministers. It is the seat of the University of The Alabama Insane Hospital, sev-Alabama. eral fine public schools, and a number of churches are among the other important buildings. Among the manufactures are flour, leather, boots and shoes, cotton textiles, clothing, and machinery. Electric lighting, waterworks, and telephones are among the facilities. It was settled in 1812 and incorporated in 1816. Population, 1910, 8,407.

TUSCANY (tus'ka-ni), formerly a grand duchy, but now one of the sixteen departments of Italy. The area is 9,304 square miles. It is situated on the Mediterranean, southwest of the Apennines, and embraces a productive part of Italy. It is divided into the provinces of Leghorn, Arezzo, Florence, Grosseto, Siena, Lucca, Pisa, and Massa e Carrara. The coast regions are level, the interior is undulating, and the western part is mountainous. Practically all the drainage is toward the southwest, the principal rivers being the Arno, Ombrone, and Cecina. It has fine vineyards and orchards and a large production of raw and manufactured silk. The chief cereals include wheat, corn, barley, and rye; the live stock, cattle, horses, mules, and sheep; and the fruits, grapes, olives, oranges, and dates. Among the manufactures are wine, straw goods, olive oil, silk textiles, porcelain, pottery, furniture, and marble products.

Tuscany formed a part of ancient Etruria, which was annexed to Rome in 351 B. C. After the fall of the Western Empire, it passed successively to the Ostrogoths, Greeks, and Lombards. Charlemagne and other Germanic emperors governed it until in the 12th century, when it became divided into several minor principalities. In 1567 the title of Grand Duke of Tuscany was conferred by Pope Pius V. on Cosmo de' Medici, whose authority was confirmed some time after by Maximilian II. A French army invaded it in 1799. The kingdom of Etruria was formed by Napoleon in 1801, but was annexed to the French Empire in 1808 as a grand duchy, Elisa, sister of Napoleon, becoming grand duchess. In 1860 it was made a part of United Italy under Victor Emmanuel. Since then extensive railroad building has been promoted and industrial and commercial enterprises have been fostered. Florence is the capital and largest city. Other cities of note include Pisa and Leghorn, the latter being the chief seaport. Population, 1917, 2,656,382.

TUSCARORAS (tüs-kà-rō'raz), an Indian tribe of North America, originally one of the Six Nations of the Iroquois. The name means shirt-wearer and is thought to have been assumed after the settlement of America by Europeans. They occupied the region now included in North Carolina at the time of its settlement,

when they had fifteen towns on the Tar and Neuse rivers and had 1,250 warriors. In 1711 they united to massacre the whites, but were defeated in the Battle of the Neuse on Jan. 28, 1712. Subsequently the hostile portion fled to New York, where they still occupy a reservation on Lake Oneida, but a small part remained friendly and continued to occupy their lands. The government purchased the land held by those remaining in 1829. Most of the Tuscaroras favored the English in the early settlements, but subsequently joined the American Revolutionary forces.

TUSCULUM, a city of ancient Latium, on the Alban range of hills, 15 miles south of Rome. Its citizens received the Roman franchise as early as 378 B. C., and it was long a favorite residence of the wealthy Romans. Cicero maintained a villa at Tusculum, and in its vicinity are the remains of a citadel, a theater, and a Forum. It was the birthplace of the elder Cato

and many other prominent Romans.

TUSKEGEE (tŭs-ke'gê), a city of Alabama, county seat of Macon County, on the Tus-kegee Railroad, about 40 miles east of Montgomery. It is surrounded by a rich cotton-growing region and has a growing trade in farm produce and merchandise. The manufactures include flour, cotton-seed oil, furniture, carriages, earthenware, and machinery. It is celebrated as the seat of the Tuskegee Normal and Industrial Institute. Other educational institutions include the Alabama Military Institute, the Alabama Normal School, and the Alabama Conference Female College. Population, 1910, 2,803.

TUSKEGEE NORMAL AND INDUS-

TRIAL INSTITUTE, an institution established at Tuskegee, Ala., in 1881, for the training of colored persons of both sexes. Instruction is given in sciences, agriculture, carpentry, blacksmithing, brick masonry, domestic economy, shoemaking, engineering, dressmaking and millinery, printing and publishing, nursing, and many other arts and trades. The purpose is to give its students a careful training in the industrial arts, as well as the elements of an education, and to elevate them in their moral and material conditions. This institution has about 70 buildings, 2,650 acres of land, and 1,250 head of live stock. The library contains 15,500 volumes, and the value of all property is placed at \$1,750,000. Tuition is free and many students can work a large part of their way through the institution. Students representing about thirty of the states are in attendance, and others enrolled come from Cuba. Porto Rico, Jamaica, and Africa. The faculty of professors and instructors numbers about 190, and the attendance is 1,500 students. See Washington, Booker T.

TUSSOCK MOTH (tüs'sük möth), the name given to a large family of caterpillars, so called from the presence of tufts of hairs upon the body. These insects have a dull color and in some species the female is wingless. It lays its

2948

eggs soon after leaving the cocoon, but dies shortly after. In about three weeks the larvae make their appearance, when they feed vociferously upon leaves, especially such fruits as the apple and pear. They drop to the ground when disturbed, or suspend themselves by a silken thread. Spraying the affected trees with arsenites often rids them of these pests.

TUTUILA. See Samoan Islands. TWAIN, Mark. See Clemens, S. L.

TWEED, a river in the southern part of Scotland, rising in Peebleshire, and, after a general course of 97 miles toward the east, flows into the North Sea at Berwick. It is famed for its beautiful scenery and for its connection with the history and literature of Scotland. The chief tributaries include the Eden, Gala, Teviot, Leader, and Till. It forms that part of the boundary between Scotland and England which lies between the Cheviot Hills and the North Sea, where its course is toward the northeast. Steamboats ascend it only a few miles from the mouth. The salmon and trout fisheries are im-

portant.

TWEED, William Marcy, public man, born in New York City, April 3, 1823; died there April 12, 1878. After securing a public school education, he entered the furniture factory of his father, and soon became connected with the city government. He was alderman from 1852 to 1853, congressman from 1853 to 1855, school commissioner from 1856 until 1857, and senator in the State Assembly from 1867 to 1871. In 1870 he was appointed commissioner of public works and while holding that position organized the famous Tweed Ring, which appropriated large sums of public money for private purposes. Samuel J. Tilden headed a strong reform movement in opposition to Tweed, which caused the latter to be arrested, but he was admitted to a million-dollar bail and the same year was elected to the State senate. He was convicted of fraud on Nov. 19, 1873, and sentenced to twelve years' imprisonment in the penitentiary and the payment of \$12,550 fine, but the court of appeals set aside this sentence. The civil courts subsequently rendered a judgment against him, in favor of the city, for \$6,000,000, and he was placed in Ludlow Street Jail in default of a \$3,000,000 bond. He escaped from prison and fled to Spain, but was returned by the Spanish government and was again imprisoned. His death occurred while he was in confinement.

TWEEDS, a kind of twilled fabric, so named from the Tweed River, in Scotland, where it was first manufactured. It is made entirely of wool, or partly of cotton and shoddy. This product has an unfinished surface and is used largely for making men's clothing.

TWELFTH-DAY, the name given to the twelfth day after Christmas, known as the festival of Epiphany. The evening of this day is called *Twelfth-Night* and is observed in many countries by social rites and ceremonies. Usu-

ally a cake containing a bean is made, known as a twelfth-cake, and the person who receives the piece containing the bean is known as the king of the festival. Shakespeare named a comic play from this night.

TWELVE TABLES, Law of the, a written code of law promulgated in ancient Rome. It was the earliest systematic statement of the Roman law and was prepared on a demand made by the plebeians. This class demanded a written code for the reason that the judges belonged exclusively to the patrician class, hence they were able to interpret the unwritten law as might best suit their convenience. Accordingly, ten magistrates were elected to write the laws, in 452 B. C., and before the end of the following year ten tables were approved by the popular assembly. Soon after two other tables were completed. The Twelve Tables were regarded as a guarantee of personal liberty. They did not constitute new legislation, but comprised a compilation of the unwritten law that had existed for some centuries

TWICKENHAM (twik'en-am), a town of England, on the Thames River, 11 miles southwest of London, with which it is connected by railway. It abounds in fine scenery and numerous suburban villas, and the surrounding district is noted for its sylvan beauty. Twickenham is famous as the home of Pope, whose monument occupies a place in the parish church. Population, 1911, 24,682.

TWIN FALLS, county seat of Twin Falls County, Idaho, 112 miles southeast of Boise, on the Oregon Short Line Railroad. It is in a fertile farming section and has a large trade. The features include the courthouse, high school, Masonic Temple, federal building, and electric

railways. Population, 1910, 5,258.

TWILIGHT (twi'lit), the glow of light after sunset and before sunrise, though popularly the term is applied only to the evening twilight, the early morning light being called dawn. It is caused by the refraction and reflection of the sun's rays by the atmosphere; hence, in the absence of an atmosphere, there would be no twilight, but light would begin abruptly at sunrise and cease immediately at sunset. The refracted rays continue to reach the earth after the sun has truly set, and, when these rays cease, the sunlight continues to illuminate the clouds and upper strata of air, which is exemplified by the sun shining on the summits of lofty mountains long after the direct rays have disappeared from the view of inhabitants of the plains below. Night ensues only after the sun has sunk so low that reflected and refracted light ceases to reach us, the same phenomenon occurring before sunrise, though in a reverse order. Twilight occurs only when the sun is less than 18° below the horizon, from which it is evident that its duration in ordinary latitudes varies considerably with the season of the year. No true night occurs in the latitude of Greenwich for a month

before and after the summer solstice, but twilight characterizes the period constantly from sunset to sunrise. This is due to the circumstance that the sun is near the Tropic of Cancer and does not descend so much as 18° below the The twilight is longest toward the horizon poles, where the night of six months is shortened by an evening twilight of about fifty days and a morning twilight of equal length. Twilight is shortest at the Equator. In the latitude of Toronto and New York City the average length of twilight is about one and a half hours, the duration being greatest in midsummer, when it is more than two hours.

TYLER (tī'lēr), a city in Texas, county seat of Smith County, 98 miles southeast of Dallas, on the Saint Louis Southwestern and the International and Great Northern railroads. It is surrounded by a fertile farming, stock-raising, and fruit-growing region. The principal buildings include the county courthouse, the United States government building, the Cotton Belt Hospital, the Texas College, the Tyler College, and a railroad hospital. Among the manufactures are canned fruits, leather, tile, furniture, brooms, cigars, clothing, coffins, pottery, ironware, and machinery. The city has electric and gas lighting, street pavements, waterworks, telephones, and street railways. It was settled in 1844 and incorporated as a city in 1875. Population, 1900, 8,069; in 1910, 10,400,

TYLER, John, tenth President of the United States, born in Greenway, Va., March 29, 1790; died in Richmond, Jan. 18, 1862. He was the



son of Judge John Tyler, Governor of Virginia, and in 1807 graduated from William and Mary College. At college he displayed a strong interest in ancient history and fondness for poetry and music, being skilled as a performer on the violin. He was admitted to the bar in 1809 and two years later became a member of

the State Legislature. His ability as a persuasive speaker became recognized in supporting the administration of Madison, especially the course of the latter which finally promoted the War of 1812. After serving continuously in the Legislature until 1816, he was chosen a member of Congress, and was reëlected in 1818 and 1820. In 1823 he again entered the Virginia Legislature, and two years later became chancellor of William and Mary College, but was chosen Governor of Virginia in the same year. He was elected to the United States Senate in 1826, where he supported Andrew Jackson in his administration policy, but later voted for the Clay resolution to censure the President for removing the deposits from the United States Bank.

In 1825 Tyler became the candidate for Vice President on the Whig ticket, receiving 47 electoral votes, but, as no candidate had a majority in the electoral college, Richard M. Johnson, of Kentucky, was elected to that office by the Senate. He resigned his seat in the Senate, owing to the Legislature of Virginia instructing him to vote for expunging the resolutions of censure upon President Jackson, and shortly after was chosen to the Virginia Legislature. In 1840 he was nominated by the Whigs for Vice President, with General Harrison as President, receiving 234 electoral votes to 48 cast for Richard M. Johnson, the Democratic opponent. On the death of President Harrison, April 4, 1841, he became President of the United States.

The more important events in the administration of Tyler include the Ashburton Treaty, the treaty with China, the termination of the Indian war in Florida, the protective tariff law of 1842, and the annexation of Texas in 1845. His veto of the bill favorable to the United States Bank, then a favorite measure of the Whigs, caused a number of his cabinet officers to resign. He was president of the peace convention in 1861, whose object was to effect a compromise between the North and the South. Subsequently he supported the Confederate cause, serving as a member of the Confederate Congress at the time of his death. He was buried in Hollywood Cemetery, Richmond. His wife, Letitia Christian (1790-1842), was the daughter of Robert Christian, a planter of Virginia.

TYLER, Moses Coit, educator, born in Griswold, Conn., Aug. 2, 1835; died Dec. 26, 1900. He studied at Yale University, where he graduated in 1857, and subsequently attended the Andover Theological School. In 1860 he entered the ministry of the Congregational Church, holding important charges at Owego and later at Poughkeepsie, N. Y., and subsequently was professor of English literature at the University of Michigan. He became instructor in American history at Cornell University in 1881, where he held the chair in that branch for a number of years. His educational work and literary efforts were alike impressive. Among his books are "A Literary History of the American Revolution,"
"Three Men of Letters," "History of American Literature During the Colonial Time," "Glimpses of England," and "The Brawnville Papers.'
TYLER, Wat. See Watt Tyler.

TYLER, William Seymour, clergyman and author, born in Hartford, Pa., Sept. 2, 1810; died Nov. 19, 1897. He studied at Amherst College and the Andover Theological Seminary, and was professor of Latin and Greek at Amherst from 1836 to 1847. In the latter year he became the professor of Greek only. He twice visited Europe and the East, where he studied to enlarge his ability as a teacher of languages, a branch of study taught by him with success for

more than fifty years. His writings and annotated works include "The Germania and Aricola of Tacitus," "Theology of the Greek Poets," "History of Amherst College," "Plato's Apology and Crito," nine books of the "Iliad," "Demosthenes's Philippics and Olynthiacs," "Histories of Tacitus," and "Prayer for Colleges."

TYNDALE (tin'dal), William, reformer and martyr, born in Gloucestershire, England, about 1484; suffered martyrdom Oct. 6, 1536. He first studied at Magdalen Hall, Oxford, and afterward at Cambridge. In 1521 he was ordained to the priesthood and soon after became chaplain and domestic tutor in the household of Sir John Walsh, in Gloucestershire. He began the translation of the New Testament into English while in the home of Sir Walsh, but, finding publication impossible in England, he went to Germany in 1524. After visiting Luther at Wittenberg, he took up his residence at Cologne, but later settled in Worms, where his first edition of the New Testament in English was published in 1526. Large numbers of the completed work were conveyed to and sold in England, where it was condemned by the government, but German printers continued to put out new editions. The clergy of England prohibited the circulation of it, and seven books against Tyndale were written by Sir Thomas More. The English government plotted to secure the arrest of Tyndale, who had taken up his residence in Antwerp in 1530, where he was finally arrested and imprisoned in the castle of Vilvoorden, about six miles from Brussels. A commission condemned him as guilty of heresy and he was put to death by strangling and his body was burned afterward. At his birthplace in Gloucestershire is a monument to his honor, erected in 1866. Besides translating the New Testament, he wrote "The Obedience of a Christian Man" and translated the first five books of the Bible, the Pentateuch.

TYNDALL (tin'dal), John, physicist and author, born in Leighlin Bridge, Ireland, Aug. 21, 1820; died in Haslemere, England, Dec. 4, 1893. He first studied and practiced surveying and engineering, and in 1847 became a teacher in Queenwood College. In 1848 he entered the University of Marburg, Germany, where he studied an advanced course in the sciences under Bunsen and other eminent teachers. Subsequently he took a course of instruction in the laboratory of Magnus at Berlin, and in 1853 was elected professor of natural philosophy in the Royal Institution of Great Britain. He joined Professor Huxley in visiting the glaciers of Switzerland in 1856, made extensive researches in magnetism and radiant heat, and in 1872 proceeded on a lecturing tour in Canada and the United States. The proceeds of 35 lectures delivered in America were placed in the hands of the committee to be devoted to aid students in making original research in the sciences.

Tyndall became president of the Birmingham and Midland Institute in 1877, and subsequently

served as the scientific adviser of the lighthouse authorities and of the board of trade. Having been a brilliant writer and effective lecturer, his writings are both numerous and valuable. He was granted degrees by Cambridge, Edinburgh, and Oxford, and received recognition from many important scientific associations. His researches have enriched knowledge in the field of radiant heat, magnetism, sound, light, electricity, and the properties of air and water. His writings embrace "Heat as a Mode of Motion," "Glaciers of the Alps," "Notes on Light," "Lectures on Electrical Phenomena," "Floating Matter of the Air," "Faraday as a Discoverer," "Forms of Water in Clouds and Rivers, Ice and Glaciers, "Diamagnetism and Magneto-Crystallic Action," and "New Fragments."

TYNE (tin), a river in the northern part of England, formed by the North and the South Tyne. The general course is toward the east, forming part of the boundary between Durham and Northumberland, and it discharges into the North Sea at Tynmouth. The length of the river from the junction is only 35 miles, but it is an important highway of commerce and is navigable to Blaydon, about 18 miles. The Derwent

and the Team flow into it.

TYNG (ting), Stephen Higginson, clergyman and author, born in Newburyport, Mass., March 1, 1800; died Sept. 4, 1885. He was a son of Dudley Atkins Tyng (1760-1829), who was noted as a jurist. He graduated from Harvard University in 1817, and, after taking orders in the Episcopal Church, began a successful pastorate at Georgetown, D. C. In 1829 he secured a charge in Philadelphia, where he remained sixteen years, and later became rector of Saint George's Church, New York, serving efficiently for 33 years. He was famous as a pulpit orator and platform speaker, organized many Sunday schools, and wrote a large number of excellent lectures and treatises. He edited for some time the Episcopal Recorder and the Protestant Churchman. His writings include "Forty Years in Sunday School," "Law and Gospel," "Esther, Queen of Persia," "Prayer Book Illustrated by Scripture," and "Captive Orphan."

TYPE (tip), a piece of metal or wood, bearing on its upper surface a cast of engraved character for use in printing. Types were first made of wood, the letters being cut in various styles of writing, such as the Gothic, Roman, and Italic. Gutenberg overcame the objections to wooden types by using brass, but since his time movable types have been vastly improved and cheapened and printing has been lessened correspondingly in price. An alloy composed of lead, tin, and antimony is now used in type making. The larger types contain the largest proportion of lead, while the smaller need to be harder to resist wear and are formed with a greater proportion of antimony. Copper and nickel are used to cover the face of types designed for various purposes, the copper rendering them harder and the nickel serving to overcome the action of chemicals in the ink. An electrotyping process is employed in the larger printing offices to make copies of the type for printing, which is described in the article treating of electrotyping.

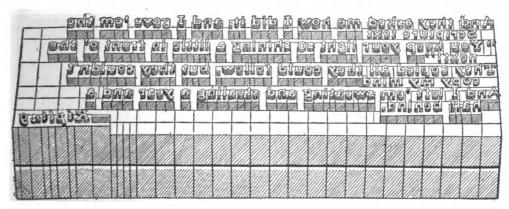
Formerly types were made by hand, and later a hand-casting process came into use, but now types are cast largely by machinery. It is possible to make 1,500 to 3,000 types by the handcasting method in a day, though by the machine process fully four times that number can be made. In type making a mold is employed, into which the molten metal is cast. Different sizes of molds are used, according to the type desired. They have the form for a letter sunk into a copper plate, the impression being made by a well-tempered steel punch, containing the design of the letter in relief. The plate of copper having the impression is placed at the end of the mold, into which the molten metal is forced by an air pump, and the type is afterward thrown out by the mold being opened. Imperfect types are remelted and those having perfect form and

of composition in any form. Formerly the sizes were described altogether by name, but now the point system above referred to is used in place of the name. The twelve-point, or pica type, is the unit, a point being equal to a seventy-second of an inch.

The following is the relative proportion of the different letters:

LETTER.	NUMBER.	LETTER.	NUMBER.
a	4.500	n	4,000
b		0	4,000
	2,000	D	1.200
	2,500		300
		r	3.500
	1,500		4,000
			5.000
	3,000		2,250
	4,500		750
	250	w	
k		x	225
	2,500		
m		Z	150

The em of eight-point is a square eight points each way. In an inch are nine ems, hence a square inch has 81 ems. To compute the number



TYPE CAST ON THE MONOTYPE AND READY TO BE PUT IN THE FORM FOR PRINTING.

a well-cast letter are finished by polishing on a marble slab. Types are cast according to a point system now generally adopted. They have a uniform height of .981 of an inch, and are usually nicked on the lower side for the convenience of the compositor.

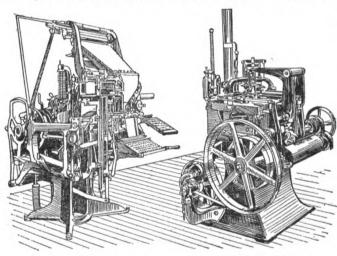
Below is a table of comparison giving the type and the measurement by points and names:

POINT SIZES	OLD NAMES	
3½-point 4 or 4½-point 5-point 5½-point 6-point 7-point 8-point 10 point 11-point 12-point 14-point 18-point	Diamond Pearl Agate Nonpareil Minion Brevier Bourgeois Long Primer Small Pica Pica English	

Types differ in width according to the letter, but the letter M, which is the nearest square, is used as the standard in measuring the amount

of ems, find the size of a page of any printed matter in square inches and multiply by 81; the product equals the total number of ems in eightpoint or brevier type. Other sizes of types may be measured by the same rule. A font or fount of type is a full set for printing. The quantity of different types in a font corresponds to the frequence of their occurrence in printed matters. A complete font of type consists of 226 different characters and includes capitals, small capitals, lower-case letters, capital italics, lower-case italics, punctuation marks, figures, and signs. The proportion of letters varies according to the characters of various languages, some using relatively more or less vowel or consonant sounds. There is likewise a difference of writers of the same language, as, for instance, Dickens's works contain relatively more vowel sounds than are used by Macaulay.

Type is set exclusively by hand only in the smaller offices and for special purposes, such as headlines in newspapers and books, and advertisements using the large bold-faced type. All the larger publishing houses issuing books and periodicals use typesetting machines, or machines in which individual type is dispensed with and the line becomes the movable unit. The first typesetting machine was patented in England in 1822. It was operated by manipulating a keyboard similar to that of a typewriter, the pressure of each key releasing a type at the upper part of the machine. The types were received in a holder below and formed a continuous line, which was then divided into the proper lengths by a second operator, and, after being used in printing, they were distributed by a mechanical device guided by the nicks on the sides. This form is still employed to a considerable extent. but the machines have been vastly improved. To this class belong the Thorne, Empire, and Simplex typesetters. The typesetting and casting machines employ matrices, which are stored at the top of the machine and fall into a holder as



THE LINOTYPE.

THE MONOTYPE.

the operator presses the keys. When sufficient matrices to form a line have been received in the holder, molten metal is carried by the machine to cast a complete line. The slugs or lines are afterward set up in the form and used in printing, after which they are again melted, to be recast. The Mergenthaler, or linotype, is of this class, and is the invention of Ottmar Mergenthaler (q. v.), a German inventor. It is capable of doing the work of eight to ten men and is used very extensively in American and Canadian printing offices. Other machines of this class include the Lanston monotype, the McMillan typesetter, the German plectrotype, and the French calendoli. See Linotype; Monotype; Printing.

TYPEWRITER (tīp'rī-tēr), a machine for producing printed characters as a substitute for writing, now employed very extensively in all countries of the world. A large variety of type-

writers are in successful use, but all agree in having a keyboard and metal keys serving to impress the letters or symbols upon the paper, through the medium of an inked ribbon or inked types. The first patent issued to an inventor of a typewriter was granted in 1714 to Henry Mill, though his invention was soon superseded by more practical devices for writing. Pierre Foucalt, a blind Frenchman, received a patent for a typewriter in France in 1841, which was used to a considerable extent in various countries of Europe. In 1843, Charles Thurber, of Worcester, Mass., invented the first really practical machine, but it did not possess sufficient speed to bring it into general use. A. E. Beach, of New York City, received a patent for a machine in 1856 which did good work, but it was not possible to write with sufficient speed.

The modern typewriter dates from 1867, when C. L. Sholes, Carlos Glidden, and S. W. Soulé, three inventors of Milwaukee, Wis., constructed

a machine that developed into the now famous Remington, Most of the credit in completing this machine belongs to Sholes, who took it to Ilion, N. Y., in 1873, where he interested the firm of E. Remington & Sons in its manufacture. This machine has been improved successively and is sold to a great extent in the markets of the world. The Remington is a bar machine, the bars being arranged in a circle, around a common center. It has a shift mechanism for printing capitals, and the necessary ink is supplied by means of a ribbon. In the Smith-Premier, Jewett, and Yost typewriters the bars have one type and are not operated by a capital shift. Machines of this class have a double keyboard, that is, a separate key for each

character printed. However, the Yost has a compound bar motion and inks the type by coming in contact with a moist pad, instead of striking against a ribbon. The Hammond, Munson, Crandall, Blickensderfer, and several others have a type wheel instead of bars, and the manufacturers claim uniform impressions and perfect alignment. Another type of machines is on the Oliver style, having U-shaped type bars, and, like the Hammond and several others, keeps the work always in plain sight of the writer. Typewriting is taught in many public schools and other institutions of learning. A skilled operator is able to write at the rate of 90 to 125 words a minute, thus exceeding the speed of a skilled handwriter by more than doubling the product.

TYPHOID FEVER (ti'foid), an infectious disease marked by great prostration. It is now known to be due to a specific germ, the typhoid bacillus, which is taken into the system chiefly

by swallowing. Some have held that typhoid is essentially the same disease as typhus, though others hold that these diseases are characterized by marked differences. Typhus more specifically affects the cerebral organization and nerve centers, while typhoid is essentially an abdominal affection, characterized by serious disorder of the bowels. Typhus is a continued fever marked by a peculiar rash or spots of a dark mulberry color, the muscular and nerve affection being at first accompanied by delirium and later by stupor. It is most prevalent among those ill fed and dwelling in badly ventilated and neglected Typhoid fever, on the other hand, is spread chiefly by infected milk, leakage of sewers from closets of typhoid fever patients into buildings, polluted soil or street dust, and an infected water supply. Formerly 14 per cent. of the cases proved fatal, but under more efficient treatment it has been possible to reduce the mortality to about 9 per cent.

TYPHOON (tf-foon'). See Storms.

TYPHUS FEVER (tī'fŭs), a contagious disease, known locally as spotted fever and jail fever. It is attended with great prostration of the vital powers, and the patient often has a rash that resembles the appearance of measles. The disease is caused by destitution, overcrowding, and want of proper sanitation. Anciently it was a common scourge in the great seaports, but the precautions of modern times have counteracted its occurrence and greatly reduced its harmful effects. The specific cause is not definitely known, but it is thought to be a microörganism. It is attended in the early stage by nervousness, headache, and rheumatic pains, followed later with nervous prostration, delirium, and the development of slightly elevated spots. The crisis occurs at the end of the second week. Since typhus is highly contagious, the patient should be promptly isolated and given careful medical attention.

TYR (tir), in Scandinavian mythology, a son of Odin and a brother of Balder. He was the god of war and fame, corresponding to the Mars of the Roman, and was prayed to by the heroes for victory. See Tuesday.

TYRANT (ti'rant), the name of a ruler in ancient Greece. Such an official was not necessarily despotic and cruel as the term implies in modern times. Tyrants usually were highly respected and powerful citizens, but who, by stratagem or by force of necessity, assumed the government of a city or a state. In many cases they were men of wisdom and their government was highly beneficial from social and commercial standpoints. These rulers appear in nearly all periods of Greek history, but they were most numerous in the 7th and 6th centuries B. C. Later the tendency of the times induced powerful families to assume authority and rule over the people in an unjust and oppressive manner. From this circumstance came the modern word tyrant, which designates a cruel and unjust executive, no matter whether he is a usurper or a legally constituted king or potentate.

TYRE (tir), a celebrated city of ancient Phoenicia, on the Mediterranean Sea, about 90 miles north of Jerusalem. It consisted of two parts, one on the mainland and the other on an island near the shore. The region surrounding it was in a high state of cultivation, yielding grain, fruits, and vegetables, and toward the inland were fine forests of fir and cedar. King Hiram of Tyre supplied Solomon with a quantity of timber and gold for the construction of the temple at Jerusalem. At that time it had excellent fortifications, the harbor was among the most secure of that period, and in commercial importance it took high rank. Its greatest prosperity is supposed to have been attained in the period ranging between 980 and 800 B.C. A colony of Tyre under Dido founded Carthage in 813 B. C. With the use of the newer city considerable trade was detracted from Tyre, thus causing it to lose prestige with its sister city, Sidon, which was situated about 25 miles toward the north.

Tyre withstood a siege by Sargon, King of Syria, but was partially reduced to submission after being besieged by Nebuchadnezzar for thirteen years, though its independence and prestige were not destroyed. Alexander the Great, in 322 B. C., besieged and conquered the city. He annexed it as a Grecian colony, constructed a mole or causeway between the island and the mainland, traces of which still remain, and restored much of its former commercial importance. Cleopatra and Antony came into possession of Tyre in the Roman period, when it still ranked as an important commercial city. It was taken by the Saracens in the 7th century, and afterward by the Crusaders, who held it until 1192. Selim I. conquered it in 1516 and since then it has been a Turkish possession. It was long famous as the chief seat of the manufacture of Tyrian purple dye, obtained from the shellfish murex. The sea has covered many of its ancient ruins, though it still has remains of tombs and walls and a Christian cathedral dating from 324. The site is partly occupied by a town called Sur. which has a population of 6,140.

TYROL (tir'ŏl), a crownland in western Austria, lying east of Switzerland and north of Italy. It has an area of 11,325 square miles, and may be regarded an eastern continuation of Switzerland, the scenery being equal in grandeur to that of the Swiss highlands. The Alps enter it from Switzerland in three chains, thus dividing the region into three large valleys. The central mountain chain, called the Tyrol or Oetzthaler Alps, are the loftiest elevations of Austria and include a number of peaks covered perpetually with snow. The northern range is known as the Tyrolese or German Alps, and the southern, as the Trent Alps. About one-third of the region has valuable forests, one-third is mountainous, and the remainder is cultivated. It has

productions of corn, wheat, rye, barley, fruits, and vegetables. Cattle, horses, sheep, swine, and poultry are reared in abundance. The mines yield coal, gold, silver, copper, iron, salt, marble, and building stone. Wine, ironware, silk textiles, embroidery, furniture, lace, machinery, and implements are among the manufactures. The language spoken is German, but a number of Italians reside in the southern part. The Romans conquered Tyrol in the year 15 B. c. and annexed it to Rhaetia. After the decline of Rome it constituted a part of Germany. The French invaded it in 1809 and conquered the region in spite of heroic resistance by the Tyrolese under Andreas Hofer, but it was restored to Austria in 1814. Garibaldi attempted to annex it to Italy in 1866, but his efforts proved abortive. Pop., 1910, (including Vorarlberg), 1,092,292.

TYRONE (tf-ron'), a borough of Pennsylvania, in Blair County, 15 miles northeast of Altoona, on the Little Juniata River and the Pennsylvania Railroad. It is surrounded by productive coal fields. The chief buildings include several public schools and a number of fine churches. About three miles distant is the Birmingham Seminary. It has electric lighting, sewerage, and waterworks. The manufactures include shoes, ironware, leather, clothing, and machinery. The region was settled in 1811 and

Tyrone was incorporated as a borough in 1857. Population, 1910, 5,847.

TZARSKOYE (tzär'skō-ye), or Sofia, a town of Russia, located 15 miles south of Saint Petersburg, noted as the summer residence of the czars. It was first made the country residence of Peter the Great. The palace was built in 1744, but since then many extensive improvements have been made. Near the palace is a castle of Gothic architecture, a smaller palace building dating from the time of Alexander I., and a triumphal arch to commemorate the expulsion of Napoleon from Russia after the burning of Moscow. The town has an arsenal and railroad facilities, and is beautifully improved by parks, gardens, and numerous public buildings. Population, 1909, 26,532.

TZSCHIRNER (chĭr'nēr), Heinrich Gottlieb, eminent theologian, born in Mittneida in Saxony, Germany, Nov. 14, 1778; died Fcb. 17, 1828. In 1801 he entered holy orders, after studying theology in Wittenberg. Subsequently he lectured in Leipsic and Meissen. He was one of the leading Protestant theologians of his time and was alike influential as a pulpit orator and lecturer. His writings include "The Reactionary System," "Readings in the Christian Faith," and "Critical Comparison of Protestantism and Ca-

tholicism."



U

U, the fifth vowel and the 21st letter of the English alphabet. The Phoenician alphabet did not have this letter and, to supply the deficiency, it was originated by the Greeks. Originally V was the capital form of the letter u, but the two were differentiated in the 15th century, although they were used interchangeably for some time afterward. The true sound of u is that of oo in cool, tool, wood and woo. This sound is still retained in most European languages. It corresponds to the French ou in tour. The letter has a short sound, as in fun, tun, and cut, and a long sound, as in due, sue, and mute.

UBANGI (ū-băn'gĭ), a river of Africa, in the central part of that continent, known near its mouth as the Mobangi. It has a course of about 1,500 miles and is a northern tributary of the Congo River, which it joins near Equatorville. The Ubangi forms the northwestern boundary of the Congo Free State, which it separates from French Congo. It was discovered by Schweinfurth in 1870 and was explored by several Europeans about ten years later. The valley of the Ubangi is fertile. A large part of the country through which it passes is

densely populated by natives.

UCAYALI, or Ucayale (oo-ka-ya'le), a river of Peru, the longest headstream of the Amazon, regarded by many as the true source of that river. It is formed by a number of branches in the western slopes of the Andes. The general course is toward the north, joining the Amazon near Nanta. The portion under its own name has a length of 1,000 miles and its main branch, the Apurimac, added to it makes its course equal to about 1,500 miles. The Ucayali River is the chief outlet of Peru toward the northeast, being navigable for small steamships a considerable distance. The valley is rich in fine forests and fertile soil.

UDALL (ū'dal), Nicholas, author, born in Hampshire, England, in 1505; died in 1556. He studied at Corpus Christi College, Oxford, where he was elected a fellow. In 1534 he became master at Eton and twenty years later was made head master of Westminster School. His reputation is based chiefly upon "Ralph Roister Doister," a comedy written after the Roman style. It was first published in 1566, ten years after his UHDE

death, and is the earliest comedy in the English now extant.

UFFIZI, a celebrated palace of Italy, in Florence. It was erected in 1560, under the direction of the Medici family, and contains one of the most valuable art collections in the world. The treasures within the palace include paintings and sculptures from the leading artists of Italy and other countries. Among the great masters represented are Michael Angelo, Titian, Raphael, Fra Bartholomeo, Correggio, Rembrandt, Holbein, and many others. The celebrated statues within the palace are "The Dancing Fawn," "The Wrestlers," "Dying Alexander," and "Venus d'Medici."

UGANDA (ŏo-gan'da), a British protectorate in the interior of East Africa, having an area of about 220,000 square miles. It is situated northwest of Lake Victoria Nyanza and east of the Congo Free State. The region is drained by the streams forming the headwaters of the Nile. A railway line provides connection with Mombasa, a seaport on the Indian Ocean. The Equator crosses the southern part, thus giving it a tropical climate, but some of the regions are sufficiently elevated to make the temperature moderately favorable to Europeans. Some of the peaks tower 15,500 to 18,000 feet above sea level, and there are eighteen glaciers on Mount Kenia, the highest summit. The soil is fertile in the valleys and plains and it has an abundance of timber. Ivory, rubber, coffee, fruits, and cattle are the chief exports. The government is administered under a British commissioner at Mengo, the capital. A large majority of the inhabitants are Bantus and Bagandas, who engage chiefly in agriculture and stock raising. The so-called sleeping sickness appears periodically, which, in 1908, caused the death of 200,000 persons. Uganda proper has a population of about 450,500, but including certain other territories, such as Usoga and Koki, it is placed at 3,750,000.

UHDE (oo'de), Fritz von, painter, born at Wolkenburg, Germany, May 22, 1848. When eighteen years of age he enrolled at the Dresden Art Academy, but soon gave up his studies to enter the military service of Saxony. In 1877 he took up the study of painting at Munich,

where he remained two years, when he removed to Paris to work under the direction of Mihály Munkácsy. In 1881 he completed the painting entitled "Family Concert" now in the museums of Cologne, which combines the coloring of old Netherland models with that of modern painters. His productions are very numerous and include a diversity of historical and genre paintings. Among his chief works are "Christ with the Disciples at Emmaus," "Wise Men from the East," "Sermon on the Mount," "Arrival of the Organ Grinders," "Woman, Why Weepest Organ Grinders," "Woman, Why Weepest Thou," "The Last Supper," and "The Ascen-He died Feb. 25, 1911.

UHLAND (oo'lant), Johann Ludwig, eminent poet, born in Tübingen, Germany, April 26, 1787; died there Nov. 13, 1862. He studied



JOHANN LUDWIG UHLAND.

at the university of his native city and, after graduating, entered upon a successful practice of law. In 1829 he became professor of the German language and literature at the Tübingen University,

but resigned four years later to devote himself to literature and politics. He was made a member of the Frankfort parliament in 1848, where he attained a wide influence as a member of the liberal party. His first literary work was published in 1815, entitled "Selected Poems," which was in fact a collection of writings produced by him at different times. This work includes a large number of patriotic songs written to express German sentiment in regard to the war against Napoleon and many of them are still popular. About 75 editions of his "Se-Poems" have been published. His dramas include "Ernest of Swabia" and "Louis the Bavarian," and his essays, "Myths of the North" and "Walter." The writings of Uhland are full of spirit and truth, and their style suggests vigorous study and sweetness of senti-ment. Longfellow's "The Black Knight" and "The Castle by the Sea" are translations from the poems of Uhland.

UHLANS (oo'lanz), a term meaning landers, the light cavalry introduced to Western Europe by the Tartars, and now maintained as an adjunct to the armies of Germany, Austria, and Russia. The uhlans of Germany were distinguished particularly for their bravery and activity in the War of 1870-71. They rendered excellent service at Sedan and several other battles.

UINTAH MOUNTAINS (ti-ĭn'tà), an elevated range of the Rocky Mountain system, in the northeastern part of Utah. They trend in a general direction from east to west and join the Wasatch Mountains some distance west of Sal Lake City. The drainage is chiefly by the Green River and its tributaries. Gilbert Peak, th highest summit, has an elevation of 13,685 fee

UJIJI (ŏō-jē'jē), a city of German East Af rica, on the eastern shore of Lake Tanganyiki. is surrounded by a fertile region and is th center of a vast interior trade. A trade rou connects it with Dar-es-Salaam. formerly a great slave market, an institution suppressed by German authority, and it is no the chief town on the lake. Most of the inhal tants are Africans. Population, 1916, 25,281.

UKRANIA, or Ukraine, the name applied the portion of southwestern Russia which co monly is known as Little Russia. It embra the governments of Ekaterinoslav, Khers Kiev, Podolia, Poltava, Tchernigov and so adjoining districts. This region was made part of Russia in the second partition of Pola in 1667. The people are a distinct class of Sk known as Ruthenians, and are related m closely to the Poles than to the Moscovites. K is the center of their political influence. Po lation, 1917, 22,500,000.

ULFILAS (ŭl'fī-las), or Ulphilas, emir Gothic scholar, born about 310; died in C stantinople in 381 A. D. It is thought that was born of Gothic parents who resided no of the Danube, though some writers think he descended from Christian parents in Cal docia and that he was carried into capti by the Goths. He studied the Gothic, Hebi and Greek languages and in 348 was co crated bishop. The barbaric people of his expelled him from their settlements, but he tired with a number of converts to Mor where he operated successfully for thirty ye He devised a Gothic alphabet after that of Greeks, translated most of the Bible into Gothic, encouraged his countrymen to engag agricultural arts, and greatly extended inte in learning and Christianity. In 360 he atter a council in Constantinople, which had I convened by the Arian Christians. A nun of the writings of Ulfilas are in the Uni sity of Prague and in the Swedish Univer of Upsala. The Bible as translated by him in common use among the Gothic people.

ULLMANN (ŏol'man), Carl, theolog born in Epfenbach, Germany, March 15, 1' died in Carlsruhe, Jan. 12, 1865. He studied der private tutors and at Halle and was 1 fessor at the universities at Halle and Hei berg. In 1853 he was made bishop in Ba Three years later he became president of ecclesiastical council, but retired after sersuccessfully for four years. His religious vi were in accord with those of Schleiermac who was his firm friend. Ullmann aided otl

in establishing the quarterly review, Studies and Critics, in which he published many reviews and essays. His chief writings are "Reformers before the Reformation," "Apologetic View of the Sinless Character of Jesus," "The Worship of Genius," and "Gregor of Nazianz." His "History of Mythology" was written in opposition to Strauss's "Life of Christ." Many of his writings have been translated into Eurasian lan-

ULM (oolm), a city of Germany, in the government of Württemberg, 45 miles southeast of Stuttgart. It occupies an elevated site on the Danube, has extensive railroad facilities, and is one of the most strongly fortified cities of southern Germany. Two fine bridges cross the Danube and unite the city with New Ulm, a town in Bavaria. The chief building is the Münster, a fine Protestant cathedral, having a seating capacity for 10,000 people. It is 475 feet long and 165 feet wide. The tower is 530 feet high, being the highest in the world. Other buildings include the palace of justice, the city hall, the post office, the railroad depot, the gymnasium, an agricultural institute, and a number of commercial and industrial schools. Among the manufactures are leather, cotton and woolen fabrics, paper, linens, machinery, sailing vessels, ironware, tobacco products, and farming implements. Electric and gas lighting, stone and macadam pavements, waterworks, electric street railways, and several fine parks are among the improvements. The surrounding country is fertile, supporting fine vineyards, orchards, gardens, and farms. Ulm occupies the site of a Roman town. It joined the Reformation in 1531 and since then a large majority of its people have been Lutherans. In 1802 it became a part of Bavaria, three years later was the scene of a noted battle between Napoleon and the Austrians, and in 1810 was made a part of Württemberg. Population, 1910, 55,817.

ULTRAMARINE (ŭl-trà-mà-rēn'), a beautiful pigment of a blue color, valued for its durable quality. It is obtained from the mineral lazulite, or lapis lazuli, and contains lime, sulphuric acid, silicia, allumina, soda, sulphur, iron, and chlorine. Formerly it was obtained only from lazulite, which is found in Chile, Persia, and Siberia, but it is now produced on a commercial basis, hence is less expensive than formerly. Painters use it both for oil and water colors. The value of this pigment consists of

being both attractive and permanent.
ULTRAMONTANISM (ŭl-tra-mon'taniz'm), the theory that the authority of the Pope should be increased rather than minimized. This view is held by a considerable number of the Roman Catholics, especially those who advocate the superiority of the Pope over the statutes of an ecumenical council. Those opposed to this view are known as Gallicans and their tendency is called Gallicanism. Ultramontanism considers the Pope superior to the general councils

and independent of their decrees, and regards him the source of all jurisdiction in the church. This view was established as a doctrine by the Vatican Council of 1870, in connection with the doctrine of papal infallibility. The name Ultramontanes is applied to political parties in Austria, Germany, and France, these representing the view that greater consideration should be given to Roman Catholicism.

ULYSSES (û-lys'sēz), in Greek, Odysseus, King of Ithaca, famous leader of the Greeks in the Trojan War. He was the husband of Penelope and the father of Telemachus. It is reputed that he lived happily with his family in Ithaca at the time Helen was carried away by the Trojans. As he was reputed of wisdom and great astuteness, he did not desire to leave his happy home for an expedition of uncertain duration, and accordingly feigned madness by plowing the seashore with a horse and an ox. The shrewd Palamedes exposed his deception by placing his infant son in the furrow, when Ulysses quickly turned aside the plowshare to save the child. He soon joined the Grecian fleet with twelve ships, where he became noted for his valor and wisdom in aiding the Greeks. After the death of Achilles, he and Ajax contended for the armor of the fallen hero, which Ulysses won. He not only invented the wooden horse taken into Troy, but was one of the Greeks who concealed themselves on the inside and took an important part in winning the city. After the final capture of Troy he sailed for his native land with his twelve ships and his return voyage, which covered a period of ten years, is the subject of the Odyssey of Homer. His first strange adventure occurred when his ships were driven to the land of the Lotophagi, where his sailors ate of the lotus fruit and thus lost all desire to see their native country and home again. Ulysses caused them to be tied and carried to the ships, after which they visited the island of the Cyclops, where they were imprisoned in the cave of Polyphemus. This giant ate six of his companions, but Ulysses finally made him drunk with wine brought from the ships and, putting out his one eye, escaped safely as the sheep were driven from the cave.

The next notable adventure of the company was on the island of Aeolus, where Ulysses received a bag filled with favorable winds as a gracious gift of the gods, but his sailors opened it at an inopportune time and the ships were again driven to the island. After losing all his ships but one, he sailed safely to Aeaea, where Circe, the sorceress, temporarily changed his companions into swine. He passed the island of the Sirens in safety by having himself tied to the mast, while the ears of his followers were filled with wax to escape being subdued by the enchanting music of the Sirens. He passed the dangers of Scylla and Charybdis in safety, but his companions killed some of the

2958

cattle of Helois at Trinacria while he slept, and a great storm arose and drowned all on board except himself. He was carried in safety to the island of Ogygia, where he lived with the nymph Calypso, who promised immortality if he would wed her. However, he effected his escape on a raft and finally returned to Ithaca, having been away from home a period of twenty years. He reached the abode of Penelope in disguise, finding that suitors for her hand had wasted his substance and occupied his palace,



MAP TO SHOW THE WANDERINGS OF ULYSSES.

but his son, Telemachus, and Minerva aided him in putting them to death. He died sixteen years after returning to his home. See Homer.

UMBELLIFERAE (ŭm-běl-lif'e-re), an extensive family of herbs and shrubs, so named from the shape of the umbels or clusters of flowers and fruit. They are found in both hemispheres, but are most numerous in the cool regions. Some writers apply the name parsley to the entire family. Most species have hollow stems and perfect umbels of flowers, but these are not uniform in all. Oil and resinous substances are derived from the leaves of many plants of this family and in many cases the odor is pleasing, while in others it is disagreeable. The roots contain starch and sugar. Many are poisonous and some yield medical properties of value, such as ammoniac and assafoetida. The species generally known and cultivated include the caraway, celery, parsley, parsnip, carrot, coriander, anise, dill, and fennel.

UMBER (ŭm'bēr), a mineral pigment of an olive-brown color when in a raw state, but composed of ocherous earth and manganese, artificial preparation. The best grade is known Umber is useful in oil and water-color paint-It is often mixed with other pigments, especially white lead.

UMBRELLA BIRD (ŭm-brĕl'là), the name of a singular bird found in South America, so called from its parasollike crest. This bird is allied to the crows. It has a stout bill, moderately large wings, a naked neck, and a chattering voice. It is not only peculiar for its crest, but likewise for its beardlike growth of feathers that project downward from the neck. Two species have been described.

UMBRIA (ŭm'brĭ-à), a division of ancient Italy, lying between the Adriatic Sea and Etru-

ria. It was situated north of the Sabine country. The region included the Upper Tiber and the Rubicon and in the early period was restricted to the ridges of the Apennines, but at a later time it developed into a powerful state. Its principal cities were Sena Gallica (now Sinigaglia), Pisaurum (Pesaro), Fanum Fortunae (Fano), and Spoletium (Spoleto). The Umbrians and Etruscans were subjected by the Romans in 308 B. C., but they joined the Samnites in a formidable struggle against the Romans at Sentinum, where they met their final defeat in 295 B. C. The name Umbria is now ap-

plied to a province of Central Italy, lying southeast of Tuscany and north of Latium. Spoleto is the capital and Perugia is the chief city.

UNALASKA (ōō-nā-lās'kà), the second largest island of the Aleutian chain, situated southwest of the Alaska Peninsula. It is 75 miles long and from 10 to 25 miles wide. The area is about 1,100 square miles. Deep-cut fiords indent the shore and much of the interior is a barren and treeless tableland. Makushin, an active volcano, has an elevation of 5,961 feet. The inhabitants consist chiefly of Aleuts and are mostly at Unalaska, or Iliuliuk, on the northern shore. Fishing, sealing, and trading are the principal industries. Population, 1908, 443; in 1912, 461.

UNCAS (ŭn'kŭs), an American Indian chief, born in the Pequot settlement of Connecticut about 1588; died near Norwich, Conn., in 1682. A disagreement in the Pequot tribe caused him to be expelled and he proceeded east from Lyme, Conn., where he reorganized the Mohegan tribe. In 1637 he formed an alliance with the colonists against the Pequots, and, being successful, he secured a portion of the conquered territory. He defeated Miantonomoh, chief of the Narragansetts, in 1643, and brought him a prisoner to the colonial authorities. The latter was killed by a brother of Uncas, after having been tried on a charge of causing disturbances among the Indians. The close friendship of Uncas with the colonists caused the Narra-

gansetts and Mohawks to make an attack upon the Mohegans. He would have been captured by the hostile Indians except for the timely arrival of Thomas Effingwell, of the British army, and as a mark of gratitude he gave the latter the tract of land now forming the site of Norwich. He was a constant friend of the English, always remaining faithful to his treaties. A monument was erected to his memory at Norwich in 1825.

UNCIAL LETTERS (un'shal), a kind of letters used in preparing Greek and Latin manuscripts during the early part of the Middle Ages. These letters are more nearly round in form than the capitals and may be said to combine some of the features of the small characters with the capital letters. The custom of using uncial letters is thought to have originated from the greater difficulty of making the angular capitals, hence ease and speed seem to have contributed to the rounder script. These letters were the prevailing style from the 6th to the 8th century.

UNCTION (unk'shun), the custom of anointing a part or the entire body with oil, as with the oil of olives. Anciently the practice was resorted to as a luxury or to promote health, but it gradually developed into a religious one. In the Roman Catholic Church it is known as the Extreme Unction and the council of Trent declared it to be a sacrament. The oil used is blessed by the bishop, which he does with great solemnity once each year on Maundy Thursday, and the oil so blessed is used during the year. In the administration of the sacrament by the priest, he dips his finger in the oil and anoints the sick person by applying it upon the eyes, ears, nose, mouth, hands, and feet. At each locality he makes the form of the cross and repeats, "Through this holy unction, and His most tender mercy, may the Lord pardon thee whatever sins thou hast committed by thy sight. Amen."

UNDERGROUND RAILROAD, the name used in the United States before the Civil War to designate the system adopted by some people in the north to aid fugitive slaves in escaping from their masters. Many thousands of fugitives were thus directed to the northern boundary, where they passed into Canada and beyond the reach of the Fugitive Slave Law. The plan included to designate certain routes and list houses at convenient intervals, known as stations, and the whites conducted or conveyed the fleeing Negroes from one point to the next. In all cases they were given food and shelter, in return for which they worked a few days, or were sheltered, transferred, and even clothed from humanitary motives. Levi Coffin was foremost in this movement and devoted nearly thirty years of his life to the enterprise. Most of the fugitives were conveyed from Virginia and Kentucky through Ohio and Pennsylvania. Thomas Garret claimed to have aided 2,700 slaves to make their escape, but was required to pay fines aggregating \$8,000. Charles Farrer is said to have personally aided 400 in escaping. According to some accounts, not less than 25,000 slaves escaped by these means during the 25 years preceding the war.

UNDERGROUND RAILWAY. See Sub-

way; Tunnel.

UNDERSHOT WHEEL, a kind of wheel used to develop power by utilizing the force of running water. It has a number of flat boards, called floatboards, placed on its circumference and is moved mainly by the impact or blow produced by the moving water acting upon the floatboards at its lowest part. This kind of water wheel is used where a large volume of water moves slowly, as in a tidal stream. In such a stream the floatboards are usually placed at right angle to the rim of the wheel and motion is obtained as the tides flow in and out. However, when the direction of the stream is constant, the floatboards are inclined at an angle to the current, in which case the water acts partly by its weight as well as by impact.

UNDERWOOD, Francis Henry, author, born in Enfield, Mass., Jan. 12, 1825; died Aug. 7. 1894. The Atlantic Monthly was founded under his plan, James Russell Lowell being its editor and Underwood officiating as chief assistant. President Cleveland made him consul at Glasgow, Scotland, in 1885, and in 1893 he became consul at Edinburgh. His literary works are numerous. Among his novels are "Man Proposes," "Cloud Pictures," and "Lord of Himself." His best known writings are those treating of literature, which were published in his "Handbooks of English-American Literature." The most popular of his works are "Builders of American Literature," "Biography of Lowell." "Handbook of English History," "Life of Longfellow," and "Biography of Whittier."

UNDERWOOD, Oscar W., public man, born in Louisville, Ky., May 6, 1862. He studied in Louisville and at the University of Virginia and practiced law at Birmingham, Ala. In 1894 he was elected to Congress as a Democrat and was reelected from time to time. He became the Democratic leader of the House in 1911 and was prominently mentioned as a candidate for

President in 1912.

UNGAVA (ŭn-gā'và), a district of the Dominion of Canada, including the peninsula of Labrador, except the Atlantic coast region, which comprises the territory of Labrador and belongs to Newfoundland. It is bounded on the north by Hudson Strait and Ungava Bay, east by the territory of Labrador, south by Quebec, and west by James Bay and Hudson Bay. The area is about 456,000 square miles. Much of the interior is a tableland with an elevation of 2,000 feet above the sea, but the northwestern part is a plain with an elevation of not more than 500 feet. The shores on Hudson Bay and Ungava Bay are low and quite uniform. Inland the

UNGER

2960

country presents a varied aspect of marshy depressions, shallow lakes, and wide and sluggish streams. Most of the drainage is into Ungava Bay by the Leaf, Koksoak, and Whale rivers. The southwestern part is drained into James Bay and a few streams flowing into the Atlantic have their headwaters in the southeastern part.

The climate of Ungava is rigorous, but the dryness of the air contributes to make the winters favorable to northern people. Nearly the entire northern half is treeless, though large areas are covered with shrubs and small plants, such as currants, cranberries, huckleberries, and gooseberries. Large forests of birch and spruce are found in the valleys of the southern part. Tundras of considerable size extend inland from the northern coast, and these are characterized by the presence of lichens and Arctic flowering plants. Some classes of vegetables, especially potatoes, mature in the southern part, but the ground is frozen from September until June. Hunting and fishing are the principal occupations. The game consists mainly of the otter, beaver, fox, bear, reindeer, and water fowl. Extensive explorations were not made of the interior until 1894. Ungava was made

a territory under the direct administration of the Dominion in 1897, but it was annexed to Quebec in 1908. The inhabitants consist mainly of Eskimos and half-breeds. Population, 1911, (estimated) 6,050.

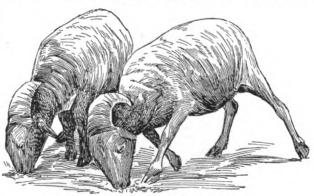
UNGER (ŏong'ēr), Joseph, jurist and statesman, born in Vienna, Austria, June 2, 1828. He studied at the University of Vienna, where he was made professor of jurisprudence in 1857. At the Austrian capital he was a leading factor in the discussion of political questions, was a liberal in politics, and joined Fischhof in publishing a work entitled "Solving the Hungarian Question." In 1867 he was made a member of the Landtag and

subsequently served in the *Reichsrat* and the cabinet. From 1871 until 1879 he was a minister without a portfolio and in 1881 was chosen president of the supreme court. His chief work as jurist consisted of systematizing the law of Austria. Among his principal publications are "The System of the Private Law of Austria," "The Law of Austria Relating to Inheritance," "Revision of the Laws of the Kingdom of Saxony," and "Decisions of the Higher Court of Vienna."

UNGULATA (ŭn-gû-lā'tà), an order of mammals which includes all those that have hoofs. Formerly the elephants were classified as Edentata, but they are now included with the Ungulates, and the list embraces many relative forms that are now extinct. The ass, zebra, horse, and a number of others have solid hoofs, while most of the animals of this class

have toes that are inclosed in a horny hoof, as the sheep, goat, deer, elk, and cattle. The ungulates are the only animals that possess horns. The larger part are included with the ruminants, which have peculiarly formed stomachs and chew their cud. The ungulates are the most important to mankind, since they include the animals that furnish a large part of the food and clothing and embrace many that aid in doing a large share of the work. As animals of draft and burden, the horse, camel, elephant, ox, ass, and reindeer are the most important. Cattle, camels, and goats furnish milk. Wool is obtained from the sheep, but material for wearing apparel is likewise derived from the goat and the llama. All the ungulates furnish skins or hides of value in the industries.

UNICORN (ū'nĭ-kôrn), an animal having a single horn issuing from the middle of the forehead. It is mentioned by a number of Greek and Roman writers, but is thought to be fabulous. The unicorn is spoken of by Aristotle and Ctesias, both of whom describe it as native to India. It is said to have been about the size of a horse, with a white body, a red head, blue eyes, and a large horn on the fore-



TWO NEPALESE UNICORNS.

head. Such an animal is not known to naturalists and it is thought that the mythical tales of unicorns arose from careless observers viewing an antelope from the side, when the larger species of that animal appear to have a single horn. Others connect the story with the rhinoceros. The unicorn is pictured on the British coat of arms. The narwhal is spoken of by some writers as the sea unicorn.

A class of sheep which are native to Nepal, in Asia, have the extraordinary peculiarity that the number of horns differs in different individuals. The number ranges from a single horn to two pairs. Specimens with two, three, and four horns are as common among these sheep as those with a single horn. The accompanying illustration of two unicorns was obtained from animals of this class which are in the zoölogical gardens of London, England. In a

native state these animals live in the mountains and are very shy.

UNIFORM (ū'nĭ-form), a particular fashion or style of dress worn by persons who belong to the same order or render the same service, as in the case of the police, the military, or a civic society. The custom of wearing some insignia or badge to designate position or rank is very ancient, and instances of it are found in the feathers and other objects worn by leaders among primitive peoples. However, authentic records of costumes do not extend back farther than the Crusades. The need for a par-ticular kind of dress to be worn by divisions of an army seems to have originated in the time when different states or nations contributed to make up one powerful army, when a distinct pattern of dress was necessary to distinguish one subdivision, or the quota of men furnished by a particular state, from the others in the general military body.

The military uniforms of nearly all countries of Europe consist, at least in part, of styles that were worn as livery by the royal servants at some time in the past, and the colors of the royal coats of arms contribute largely in making up the respective apparels. In modern times the tendency has been to dispense with the gaudy and more attractive styles of dress, especially while in action, since the use of modern firearms makes it very desirable that the troops be uniformed as inconspicuously as possible. Khaki dye was introduced as early as 1880 for coloring uniforms, but originally it was not a fast color. In 1884 a fast dye was obtained and now both cotton and woolen materials are colored with this product, giving the uniforms a plain drab or dust-color appearance. While the advantage is that a body of men in action is thus less conspicuous, there is the disadvantage of having both contestants appear somewhat alike, which gave rise to frequent disadvantages even in the Anglo-Boer war. Khaki color is now used to a considerable extent in painting the vehicles and large arms as well as the uniforms, the helmets, and the haversacks. This gives the soldier a dull shade and renders him practically invisible while partly obscured by the smoke while in action. There is likewise a tendency to dispense with the prominent marks that distinguish officers in the field, making them less liable to be singled out as a target for riflemen.

Uniforms used in the modern navies are quite similar, both in color and in style or pattern. In general the colors are blue or white, and the means of distinction are found in epaulettes, insignia, and gold lace. Each service has its special regulation as to the details provided for the purpose of distinguishing it from the others. The distinctive marks of rank are usually on the sleeves and shoulders, being in the form of straps or stripes. The styles differ according to the season and climatic influences. In general

the uniforms in the navies of Great Britain and the United States are quite similar. Officers have eight different suits, each intended to be worn on a specific occasion. These include what is known as the full dress, ball dress, frock coat, frock coat with epaulettes, undress, mess dress, mess undress, and white undress. In the navy of the United States the officer wears a double-breasted coat with brass buttons instead of the undress uniform common in the British navy.

UNION, a town of New Jersey, in Hudson County, one mile north of Hoboken. It is situated on the Erie, the West Shore, and the New York, Susquehanna and Western railroads and carries a large industrial trade. Among the features are the public library, the high school, the public park, and many fine churches. The manufactures include silk goods, malt liquors, clothing, and machinery. Population, 1905, 17,005; in 1910, 21,023.

UNION, a city of South Carolina, county seat of Union County, 65 miles northwest of Columbia, on the Southern Railway. It is surrounded by a fertile farming country, which produces large quantities of cotton and fruits. The manufactures consist of hosiery, cotton-seed oil, ice, cotton goods, and machinery. Among the chief buildings are the county courthouse, the public library, the city hall, and a number of fine schools and churches. Electric lighting and waterworks are among the public utilities. It has a growing trade in farm produce and merchandise. Population, 1910, 5,623.

UNION OF SOUTH AFRICA, a possession of Great Britain, formed in 1910 by uniting Cape Colony, Natal, Transvaal, and the Orange Free State. The area is 473,100 square miles. In 1914 the population was 5,998,460, of which 1,280,480 were Europeans. See Cape Colony, Natal, etc.

UNION THEOLOGICAL SEMINARY, an institution of New York City, incorporated in 1836. It is a Presbyterian institution with

about 250 students.

UNIONTOWN, a city in Pennsylvania, county seat of Fayette County, 70 miles southeast of Pittsburg. It is on the Pennsylvania and the Baltimore and Ohio railroads and is surrounded by agricultural territory, which produces cereals, grasses, and fruits. In the vicinity are deposits of iron and coal, and large quantities of both minerals are transported from the region annually. The features include the county courthouse, the public library, the high school, and many churches and business houses. Among the manufactures are flour, tobacco products, clothing, iron and steel wares, carriages, glass, and machinery. It has gas and electric lighting, electric street railways, waterworks, and sanitary sewerage. The place was settled in 1767 and incorporated in 1796. Population, 1900, 7,344; in 1910, 13,344.

UNIT, in arithmetic, the name applied to a single thing, as one or unity, represented by

the figure 1. In a wider sense, a number is a unit, or a collection of units classed under the same name, and answers the question, How many? In this sense the unit of a number is one of the things it expresses; thus, in five cents, one cent is the unit. Sometimes units are only relative in their character; thus, one foot is a unit in regard to feet, but it is only a part of a unit in regard to yards.

Three units are commonly used in electrical engineering. These are the unit of current, called the *ampcre*; the unit of potential, called the *volt*; and the unit of resistance, called the *ohm*. For some purposes these quantities are subdivided; thus, in telegraphy the practical unit is the *milli-ampere*, that is, one-thousandth of an ampere. In some cases it is convenient to use multiples, as in the expression of insulation resistances in terms of *meg-ohms*, that is, a million ohms. The following multiples are used commonly:

1 megohm=1 million ohms,

1 microhm=1 millionth of an ohm,

1 kilowatt=1,000 watts,

1 microampere=1 millionth of an ampere.

The following are units for the various purposes stated:

One cubic foot of distilled water at 62° Fahr. is the unit of specific gravity for solids and liquids and one cubic foot of atmospheric air at 62° Fahr., for air and gases.

The quantity of heat necessary to raise the temperature of one pound of pure water from 39° to 40° Fahr. is the unit of heat, or the thermal unit, and in the metric system it consists of the amount of heat necessary to raise the temperature of a gram of pure water from 3.94 cent. to 4.94 cent.

In the metric system, the centimeter is the unit of length; the gram, the unit of mass; and the second, the unit of time. Hence, the square centimeter is the unit of area; the cubic centimeter, the unit of volume; and a velocity of one centimeter per second, the unit of velocity. The momentum of a gram moving with a unit velocity is the unit of momentum.

velocity is the unit of momentum.

UNITARIANISM (ū-nĭ-tā'rĭ-an-ĭz'm), the doctrine of those professing Christians who, conceiving the Godhead as unipersonal, regard the Father as the only true God. The term Unitarian was used as early as Oct. 25, 1600, in a decree of the Transylvania diet, and was adopted by the Transylvanian Unitarians as the designation for their church in 1638. This branch is now known as the Hungarian Unitarian Church and has 60,000 members in Europe. Allied sects are well represented in many countries of Europe, especially in Great Britain and Poland. Unitarianism in America sprang from the Congregational body in the early history of New England, but it may be said to date as a distinct organization from the early part of the 19th century, when the preaching of William E. Channing and others brought its doctrines

into prominent notice. The general body of American Unitarians accepts the Bible and the divinity of Christ, though the latter is not identified with the Deity. It has 575 ministers, 475 churches, and 78,500 communicants in the United States. The chief periodicals include The Pacific Unitarian, San Francisco; The Christian Register, Boston; The Church Exchange, Portland, Me.; The Unitarian, Boston; and The New Unity, Chicago. The church property has an estimated value of \$10,285,000. In 1918, Canada had 4,000 Unitarians.

UNITED BRETHREN IN CHRIST, a Protestant religious denomination, founded in Pennsylvania in 1760 by Philip William Otterbein (1726-1813), a missionary of the German Reformed Church. The members of this denomination are now mostly English-speaking people. Like the Methodists, they have classes and class leaders, local and itinerant preachers, circuits, and conferences. The ministers are designated as elders. At present there are two regularly organized branches, called the Old and New Constitutions. The former has 975 churches, 725 ministers, and 45,500 members; while the latter has 4,250 churches, 2,525 ministers, and 260,000 members. The belief of those holding under the old constitution is Arminian, and those holding under the new constitution have a form of doctrine allied to that of the Congregational, Presbyterian, and Methodist churches. Missionary work is carried on in many foreign countries, especially in Africa, where the church has 450 preaching places and 7,500 members. The theological institutions include Otterbein University, Westerville, Ohio; Western College, Toledo, Iowa; and Lane University, Lecompton, Kan. The chief publishing house is at Dayton, Ohio, where they also maintain the Union Biblical Seminary. In Canada the United Brethren (Moravians) are represented by 1,650 members.

UNITED KINGDOM. See Great Britain. UNITED STATES, the political division which occupies the central part of North America, the most powerful republic in the world, called officially the United States of America. It is bounded on the north by the Dominion of Canada, east by the Atlantic, south by the Gulf of Mexico and the Republic of Mexico, and west by the Pacific. The greatest extent from east to west is 3,100 miles and from north to south, 1,780 miles. It has an area of 3,025,600 square miles, exclusive of Alaska, which has an area of 577,390 square miles. The total area of the United States and Alaska is given by the United States Coast and Geodetic Survey to be 3,602,990 square miles, and, including the island possessions, 3,743,313 square miles, an expanse of territory larger than all of Europe. Alaska, which occupies the northwestern part of North America and includes the Aleutian Islands, is described in a special article. For information on the political divisions

and the colonial possessions of the United States, the reader is referred to the articles in which they are specially treated.

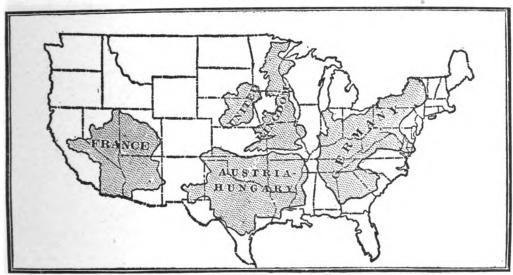
The following table contains a list of the principal possessions, together with the area:

NAME.	AREA.
Alaska	590,884
Cagayán de Joló (Sulu)	1.029
Guam	190
Hawaii	
Panama Canal Zone	474
Philippines	
Porto Rico	
Tutuila (Samoa)	
United States	
Total	,743,313

BOUNDARIES. A large part of the northern boundary is formed by the 49th parallel, which extends from the Strait of Georgia, an inlet from the Pacific, to the Lake of the Woods, on the northern border of Minnesota. This line

coast line, which is 2,350 miles long exclusive of indentations, is characterized by a number of large bays and inlets, which include Penobscot, Cape Cod, Chesapeake, New York, Massachusetts, Delaware, and Narrangansett bays and Long Island, Pamplico, and Albemarle sounds.

The southern boundary is formed in part by the Rio Grande, from the Gulf of Mexico to about the middle of the southern border of New Mexico, whence the boundary follows an arbitrary line to the Colorado River. From the point of intersection of the arbitrary line and the Colorado, the border follows that stream northeast to the mouth of the Gila River, whence it runs almost due west to the Pacific. The western coast is indented by San Diego, San Francisco, and Willapa bays, Grays Harbor, and Admiralty Inlet, an extension from the



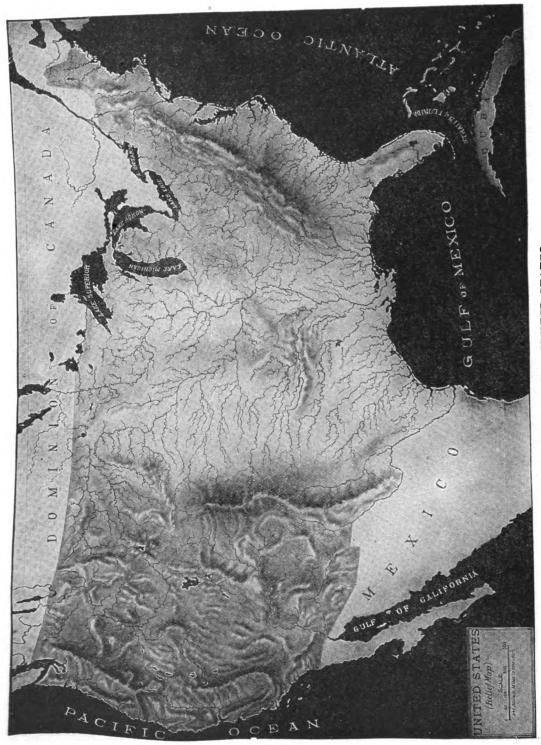
MAP TO SHOW THE COMPARATIVE SIZE OF THE UNITED STATES.

is the most northern part of the United States, except a small peninsula in the western part of the Lake of the Woods, which extends about 25 miles farther north. From the Lake of the Woods the northern boundary extends eastward along the channel of the Rainy and the Pigeon rivers and through lakes Superior, Huron, Erie and Ontario, dividing these lakes about equally between the United States and Canada, except the larger part of Lake Superior belongs to the United States. East of Lake Ontario the boundary extends a short distance along the main channel of the Saint Lawrence River, to the 45th parallel, which it follows along the northern border of New York and Vermont, thence it passes northeast along the border of New Hampshire and Maine. From the northerly point of Maine it extends southeast, following partly the Saint John River, then it extends along an arbitrary line to the Saint Croix River, which it follows to the Atlantic. The Atlantic

Strait of Juan de Fuca. In the northwest the border is formed by the Strait of Juan de Fuca, the Canal de Haro, and the Gulf of Georgia, which separates the country from Vancouver Island. The total coast line, including the inlets, but exclusive of the Great Lakes, is 12,608 miles. This embraces 2,280 miles on the Pacific, 3,468 on the Gulf, and 6,861 on the Atlantic. A shore line of 3,618 miles on the Great Lakes, in addition to the above, makes the entire coast 16,226 miles.

ISLANDS AND PROJECTIONS. The islands off the Atlantic coast include Long Island, Nantucket, Staten, Martha's Vineyard, Manhattan, Roanoke, and Florida Keys. Those in the Gulf of Mexico comprise the islands of Santa Rosa, Galveston, Saint George's, Tortugas, Padre, and the Chandeleur group. The San Juan, Santa Catalina, and Santa Cruz groups are the chief islands off the Pacific coast.

Three large peninsulas project from the



2964

mainland, including Florida, between the Atlantic and the Gulf of Mexico; Lower Michigan, between lakes Huron and Michigan; and upper Michigan, between lakes Superior and Michigan. Among the chief projections on the Atlantic coast are Cape Cod and Cape Hatteras; on the Gulf Coast, Cape Saint Blas and the Delta of the Mississippi; and on the Pacific coast, capes Mendocino and Flattery.

GENERAL DESCRIPTION. The United States, except its distant insular possessions, is wholly within the North Temperate Zone, the belt that comprises the seat of the leading nations of the world. It has much diversity of surface, climate, soil, and products. Five expansive natural divisions, differing in slope and elevation, make up the vast region extending from the

toward the southeast into the Atlantic. Most of the rivers are small, but they flow with considerable rapidity, thus supplying an abundance of water power to many cities of commercial and manufacturing importance. The chief rivers of this section include the Penobscot, Kennebec, Hudson, Connecticut, Delaware, Potomac, Susquehanna, Roanoke, James, Neuse, Cape Fear, and Savannah.

The Appalachian highlands consist of several parallel ridges and chains, having altogether a breadth of about one hundred miles and including many long valleys. Some of the valleys are stony and unproductive and others possess remarkable fertility. The mountains are comparatively low, only a few of the peaks exceeding 6,000 feet in height. The



MAP TO SHOW THE PHYSICAL DIVISIONS OF THE UNITED STATES.

Atlantic on the east to the Pacific on the west. These include the Atlantic slope, the Appalachian highlands, the Mississippi valley, the western highlands, and the Pacific slope.

The Atlantic slope is situated between the Atlantic and the Appalachian Mountains. It is but a few miles wide in the north, but gradually widens toward the south, forming an expanse of about 300 miles at the point where it joins the plains of the Gulf of Mexico. A narrow belt lying along the sea is known as the Atlantic coast plain, which gradually rises toward the west, where it finally merges into the Piedmont plain (q. v.). The latter comprises the foothills of the Appalachians and consist chiefly of a plain from a few hundred to a thousand feet above the sea.

The drainage of the Atlantic coast plain is

highest points are in North Carolina and New Hampshire, being called the Blue Ridge Mountains in the former State and the White Mountains in the latter. Mount Mitchell is the highest peak of the Blue Ridge and Mount Washington of the White Mountains. Both rainfall and climatic conditions are quite favorable in the Atlantic coast plain and the Appalachian highlands, hence a considerable per cent. of the regions is covered with grasses or is susceptible to successful cultivation. These two divisions are the seat of the many noted manufacturing cities and are penetrated by numerous canals and railroads.

The Mississippi valley comprises the great central plain lying between the Appalachian highlands and the Rocky Mountains. It contains more than two-fifths of the territory and more than half of the population of the United States. This region is the most fertile and healthful farming and stock raising section of North America and of the world. It extends northward to the Great Lakes, where a large scope of country is known as the Lake Region, including all of Michigan and portions of Ohio, Indiana, Illinois, Wisconsin, and Minnesota. The drainage is by the Mississippi and its vast network of tributaries, including the Wisconsin, Illinois, Ohio, and Yazoo from the east, and the Minnesota, Des Moines, Missouri, White, Arkansas, Washita, and Red from the The surface is chiefly an undulating west. plain, traversed by belts of timber along the streams in the north and covered with considerable forests in the south. It has an average elevation of about 1,000 feet above sea level, the surface rising gradually from the Gulf of Mexico, where the elevation is only a few feet, while in the central part it is about 1,000 feet and in the northern part it is about 1,900 feet. The Ozark Mountains, a low range of highlands, traverse parts of Missouri, Oklahoma, and Arkansas, and another group of mountains, the Black Hills, is situated on the boundary between Wyoming and South Dakota. There is a general rise from the 99th meridian westward, and the region between it and the Rocky Mountains is a more or less elevated section. This scope of country extends from the Gulf of Mexico to the Canadian line, ranging in width from 200 to 500 miles, and is called the Great Plains. Much of the soil is naturally fertile, with sandy tracts along the western parts, but a lack of rainfall renders irrigation profitable for the production of cereals in portions of these plains, especially in eastern Colorado and Wyoming and western Nebraska, Kansas, and Oklahoma.

The western highlands include the region occupied by the Rocky Mountains, the Coast Range, the Cascade Range, and the Sierra Nevada Mountains. This section is from 500 to 1,000 miles wide, comprising many elevated ridges and extensive valleys, and nearly all of it is more or less arid. The Rocky Mountains constitute the eastern chain of the highlands, forming the watershed between the Mississippi system and the rivers farther west. Between them and the Cascade Range and Sierra Nevada Mountains is the great plateau that includes the Wasatch Mountains and Great Salt Lake. Some of the peaks attain to heights of 12,500 to 15,750 feet, their summits being covered perpetually with snow, but their slopes are covered more or less with hardy forest trees. Many of the great rivers of America have their source in the Rocky Mountains, among them the Missouri, Colorado, Platte, Arkansas, Red, Rio Grande, Pecos, Columbia, and Yellowstone. In the great basin are the Bear and Jordan rivers, flowing into Great Salt Lake, and the Humboldt, flowing into Humboldt Lake. Between the Sierra Nevada Mountains and the Coast Range is the fertile valley of central California, through which flow the Sacramento and San Joaquin rivers. It is characterized by many fine lakes, beautiful waterfalls, and scenic cañons.

The Pacific slope includes the region west of the Cascade Range and Sierra Nevada Mountains. It is diversified by numerous valleys and mountain groups. Besides the Sacramento and San Joaquin rivers, it includes the Willamette, Umpqua, Roque, and Klamath rivers, and the lower course of the Columbia. The Pacific coast has precipitous and rocky shores and stretches from Lower California to the Strait of Juan de Fuca, a distance of 2,280 miles. The principal inlets include the bays of San Diego, San Francisco, and Monterey. Puget Sound, an inlet from the Pacific through the Strait of Juan de Fuca and Admiralty Inlet, is in the northwestern part of Washington. Dead Valley, a depression in Southern California, is about 300 feet below the level of

Drainage. The rivers furnish about 24,500 miles of navigation facilities. Many of the principal streams have already been mentioned under the five natural divisions into which the surface of the United States may be divided. However, the drainage may be classified into five distinct divisions, depending upon the direction in which their waters reach the sea. These include the rivers that belong to the systems of the Gulf, the Atlantic, the Pacific, the Great Lakes, and the Great Basin. They are important in the order named, both from the volume of water discharged and their relative importance commercially. The system of the Gulf, besides the Mississippi and its tributaries, includes the Appalachicola, the Alabama, the Sabine, the Pearl, the Trinity, the Brazos, the Colorado in Texas, the Nueces, and the Rio Grande. While all of them are more or less important in navigation, those flowing through the arid region of the Great Plains serve for irrigation. Few of the rivers belonging to the Great Lake system are large, but the Saint Lawrence, which forms the outlet to the sea, has vast value in the industries as a highway of commerce. The larger of these rivers include the Saint Louis, the Maumee, and the Genesee.

The rivers of the Atlantic coast plain are characterized by an escarpment at from 40 to 100 miles from the sea, hence the navigation in most cases extends to that point. Many of them discharge by broad estuaries, which furnish fine harbors, such as those of the Delaware, the Hudson, and the Potomac. Only two of the rivers belonging to the Pacific slope are of large size, but many are important through their passage over escarpments, since they furnish an unlimited amount of water power. They are used largely for irrigation purposes

in the arid regions. The Columbia, in the northwest, and the Colorado, in the southeast, are the two largest. The Columbia is partly in Canada, receives the Snake, and discharges into the Pacific. The Colorado receives the Green. A part of its lower course is in Mexico, where it enters the Gulf of California. Three rivers of the extreme west are the Willamette, in Oregon, and the Sacramento and the San Joaquin, in California. The Great Basin system has no visible outlet to the sea, but many of the streams are of value in irrigation. Much of the drainage is into Great Salt Lake by numerous small streams, including the Sevier River. However, the largest stream of this section is the Humboldt, which disappears in Humboldt Lake.

LAKES. Small inland sheets of water are abundant in the northern section, especially in Michigan, Wisconsin, and Minnesota, each of which has many hundreds of fresh-water lakes. The Great Lakes in the north are lakes Superior, Huron, Erie, and Ontario, these forming a part of the northern boundary, and Lake Michigan, which lies wholly within the United States. Other lakes of importance are Moosehead, in Maine; Winnepesaukee, in New Hampshire; Champlain, between New York and Vermont; Onega, Cayuga, and Seneca, in New York; Okeechobee, in Florida; Winnebago, in Wisconsin; Pontchartrain, in Louisiana; Red, Leech, and Mille Lacs, in Minnesota; Devil's, in North Dakota; Flathead, in Montana; Yellowstone, in Wyoming; Utah, Sevier, and Great Salt Lake, in Utah; and Klamath, Tahoe, and Tulare, in California.

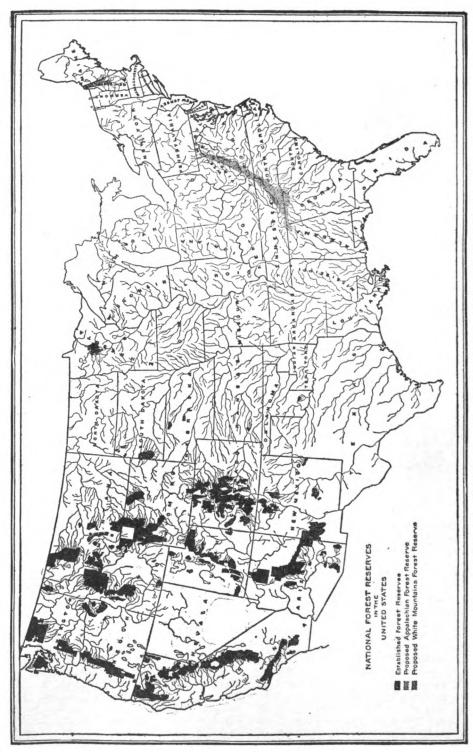
CLIMATE. The climate and soil of a region so vast as that included in the United States are necessarily diversified. In the southern part, as in California and Florida, the climate is almost tropical, but there is a gradual lowering of the temperature as we proceed toward the higher altitudes and toward the northern part of the country. However, every part of the United States has a climate favorable to Europeans. The winters are cold in the northern part, but not to such an extent that man and domestic animals are materially hindered in the enjoyment of life, while that region has peculiarly pleasant and agreeable summers. In the western highlands and the Great Plains rainfall is considerably limited, but all other sections have an abundance of moisture for the culture and maturity of cereal crops, grasses, vegetables, and fruits. The mean annual rainfall east of the Missouri and Mississippi is about 37 inches; between the Missouri and the western highlands, from ten to thirty inches; and in the western highlands, from five to twelve inches. However, some minor sections of this region, as in parts of Nevada, are practically rainless. The region lying along the Pacific coast, from the Bay of San Francisco to Vancouver Island, has an average rainfall of from 40 to 60 inches; the region from the Brazos River, Texas, to southern Virginia, from 40 to 58 inches, and that from southern Virginia to northeastern Maine, from 30 to 50 inches.

The mean annual temperature has a corresponding variation in the different sections of the country. It is about 70° in the southern parts which are not materially affected by elevation or sea breezes, 55° throughout the central region, and from 45° to 50° in the northern part. In the north central section the average minimum falls as low as 40° below zero, as in northern Minnesota and Wisconsin, where the extreme low temperature sometimes falls to 60° below zero. On the other hand, the highest temperature is reached in the drier parts of Arizona and Texas, where the thermometer rises as high as 115° to 120°. As a whole the climate is controlled largely by characteristic winds, but the storm centers which pass over the country originate almost equally on the Atlantic and the Pacific. The stormiest portion of the country is in the region of the Great Lakes, which is in the path of the movement of winds from the West Indies and the slopes of the Rocky Mountains. These winds cause a large range of temperature within the year, ranging from 60° in Florida to about 150° in the central part and the upper valley of the Missouri River.

The vast range of rainfall and temperature is important as a factor in the yield of agricultural products, for which the country is noted. The most productive lands lie along the eastern coast plain and the rivers of the great interior, but by far the largest scope of productive and arable land is within the Mississippi basin. Extensive regions of the western highlands have fertile soil, but lack a sufficient quantity of moisture, though there are large tracts entirely sterile, as large parts of the Utah basin. Vast scopes of country are fitted principally for grazing lands, as the plains of western South Dakota, Nebraska, Kansas, Oklahoma, eastern Colorado and Wyom-

ing, and northwestern Texas.

The United States is NATURAL SCENERY. not surpassed by any other country in grand and beautiful scenery. Niagara Falls, the most noted cataract in America, is surpassed in height and the volume of water only by Victoria Falls, on the Zambezi. Yosemite Falls, in California, has a total height of 2,600 feet, in a series of three falls. The Falls of the Yellowstone, in Wyoming, is one of the wonders of the Yellowstone National Park. Shoshone Falls, on the Snake River, is next to Niagara among the falls of America in the volume of water passing over the precipice. The trip up the Hudson, from New York City to Albany, is rivaled only by that of the Rhine. Another trip of great beauty is from Portland, Ore., down the Willamette to the Columbia, thence up the Columbia to The Dalles, which



MAP TO SHOW THE ESTABLISHED AND PROPOSED FOREST RESERVES OF THE UNITED STATES.

for imposing scenery surpasses that of the In the Appalachian Highlands are beautiful mountain lakes and deep gorges, through which clear streams wind like a silvery thread. The Water Gap, in the Delaware; the Pallisades, on the Hudson; and the Crawford Notch, in the White Mountains, are characteristic scenes of much grandeur. Other scenery of great beauty includes the Natural Bridge, in West Virginia; the Mammoth Cave, in Kentucky; the Grand Canyon, on the Colorado; the Whirlpool and Gorge, on the Niagara; and the Royal Gorge, in the Yosemite Valley. Yellowstone National Park, which is reserved by the government for the free use of the public, is a wonderland of canyons, waterfalls, geysers, and thermal springs.

FORESTS AND PLANT LIFE. The forests are peculiarly valuable and extensive. Scarcely any section of the country is entirely destitute of plant growth and the area of timber is proportionally large. Forests of valuable native woods are extensive throughout the regions which have an abundance of rainfall. continue to yield large quantities of lumber and other timber products, and considerable growths of cedar and other evergreen trees are found even in the arid highlands of the West. All the section east of the Mississippi was formerly rich in primeval timber, fine tracts of which still remain in many sections, and a continuation of these forests extends into the section comprised in Missouri, Arkansas, Louisiana, Oklahoma, eastern Texas, eastern Kansas, and southern Iowa. The prairies of the northern Mississippi valley are enriched by belts of timber along the streams and in the western highlands are scattered tracts or belts, particularly in the cañons and valleys and on the mountain sides. In the region of the sources of the Mississippi and along the southern shore of Lake Superior splendid forests still abound. This is true also of Washington, Oregon, and California, where thrive the redwood and other great trees of the American continent.

Tree growth is limited most notably in the western sections of the great plains, though there are groups and belts of cottonwood, box elder, and willow trees along the streams, but in the Llano Estacado, or Staked Plains, of Texas and New Mexico, tree growth is very limited or entirely absent. Among the most abundant trees of North America are the oak, chestnut, beech, ash, black and white walnut, maple, hickory, locust, buckeye, laurel, cypress, azalea, magnolia, tulip, elm, pine, catalpa, cedar, arbor vitae, persimmon, redwood, guava, holly, acacia, fir, hackberry, pecan, birch, dogwood, palmetto, and hemlock spruce. The redwood and big tree, two species of the sequoia, found in California, are the largest trees of North America.

The plants which are native to the United States exceed in number those of Europe, the trees alone including about 400 species. As a

whole the plant life is of the kind which characterizes the Temperate Zone, but it assumes a semitropical form in the southern part, as in Louisiana and Florida, where much of the vegetation resembles that of the West Indies. The native grasses are very numerous, ranging from the large forms of the Dismal Swamp to the small and highly nutritious buffalo grass of the arid regions of the West, but the latter in many sections is interspersed with cacti bunch grass, and sagebrush. Indian corn, or maize, and tobacco, two plants of high economic value, are native to the country. Practically all the more valuable commercial plants of Europe and Asia have been naturalized and are grown on a large scale, such as cotton, rye, oats, wheat, barley, clover, beans, oranges, lemons, etc.

Animal Life. Formerly vast herds of wild animals inhabited the different sections now comprised within the United States. Buffaloes, elks, deer, and antelopes were abundant in the Mississippi valley and the western plains, and great flocks of aquatic birds found their home in the interior waters. The rapid settlement and improvement of the country has caused the larger species of wild animals to become limited and at present only scattering remnants are found in different sections. The buffalo or bison has disappeared almost entirely, only small herds remaining in captivity and in the Yellowstone National Park. Elk, deer, antelopes, and kindred animals which were formerly very abundant, are now quite limited. Those remaining are confined largely to the mountains and highlands. Monkeys were never found in any part of the United States. The animals still quite abundant include the badger, bear, muskrat, wildcat, prairie dog, panther, skunk, rat, glutton, hare, lynx, raccoon, rabbit, mountain porcupine, mink, squirrel, woodchuck, fox, wolf, and cougar.

Many species of birds of song and plumage are native to the country, particularly in the Southern States, and aquatic birds are numerous in the watered and less populated districts. Among the edible birds are the duck, goose, snipe, grouse, prairie chicken, quail, plover, pigeon, partridge, brant, wild turkey, and sandpiper. Other birds more or less abundant are the humming bird, lark, heron, crane, coot, ibis, gull, mocking bird, finch, sparrow, flamingo, pelican, crow, hawk, owl, swallow, buzzard, falcon, woodpecker, vulture, and parrot. The alligator is found in the marshy regions of the Southeast, but it is becoming less numerous, being hunted for its skin. Lizards, tortoises, and turtles are common animals and serpents are indigenous to all sections, but they vary greatly in size and number with latitude and climatic conditions.

FISHERIES. The fishing industry of the United States had its origin in New England during the colonial period, and the enterprise is of such extent that the country is not surpassed in the

value of the output. Although it seemed probable that some species might be exterminated from a lack of definite knowledge of methods of propagation, much has been done by the government and the states to obviate this difficulty. Hatcheries are maintained under the direction of the United States Fish Commission, by which extensive investigations and experiments are promoted. Both the interior waters and those lying off the coasts are valuable fishing grounds. Whaling was a productive enterprise until the middle of the 18th century, when the whale abandoned the waters off the coasts for seas farther north and south, but the catches of Alaska are still productive. The states that border on the Gulf, the Great Lakes, the Atlantic, and the Pacific have the largest tisining indus-

abundant, but the mines are worked with great success. It is estimated that the coal measures have an extent of 350,000 square miles. finest anthracite coal deposits of the world are found in Pennsylvania, where gas and mineral oil are also abundant, and extensive deposits of bituminous coal are found in the region of the Appalachians, extending from New York to Alabama. Another vast belt of bituminous coal extends from Pennsylvania westward to Iowaeastern Kansas, and Oklahoma. Bituminous coal occurs in extensive deposits in various sections of Michigan and the western highlands especially in Wyoming, New Mexico, Montana Idaho, and Colorado. Lignite coal is produced in large quantities for fuel and steam in North Dakota and elsewhere. Petroleum and natural gas



MAP TO SHOW THE SWAMP LANDS OF THE UNITED STATES.

Sponges and pearls are obtained off Florida and California. Lobsters and clams are taken off the coast of Maine, and the oyster industry is especially prolific in Chesapeake Bay and Long Island Sound. The salmon fisheries of the Columbia River and Alaska yield large returns and the buffalo, the cat, and the German carp are plentiful in many waters. Sealing is profitable in the Alaskan seas. The Great Lakes yield whitefish, lake trout, and herring. Cod, bluefish, halibut, and menhaden are among the leading fishes of the Atlantic. Other species include the mackerel, perch, mullet, shad, ray, eel, pike, carp, and scallops. About 214,500 persons are employed in fishing and the value of the output is \$48,750,000 per annum.

MINING. The mineral wealth is not only

are abundant in the coal regions of Pennsylvania, West Virginia, Ohio, Indiana, Kentucky, Kansas, Texas, Oklahoma, Colorado, California, and other states. Lead deposits occur in Illinois, Missouri, Arkansas, and Iowa. Copper is found in the regions of Lake Superior, especially in Michigan, and in Montana and Arizona. Zinc occurs in Missouri, Pennsylvania, and New Jersey.

Iron is widely distributed, especially in the Appalachian highlands, in the Ozark Mountains of Missouri, in Georgia and Alabama, and in the iron range of Michigan and Minnesota. Gold and silver are found in Colorado, Wyoming, California, Nevada, New Mexico, Oregon, Montana, Utah, and a number of other states. Other minerals more or less widely distributed include

gypsum, marble, cobalt, iridium, nickel, copper, salt, salt rock, slate, limestone, granite, mercury, etc. Particular mention is made of the minerals found in the United States in the articles treating of gold, silver, iron, copper, etc., which see. The greatest development of mineral resources is in the states of the East and Central West and in the western highlands, but capital has been seeking investment in many of the Southern States, where the manufacturing and mining interests are developing with almost equal pace. No country of the world has excelled the United States in the employment of modern machinery in operating mines and utilizing their

products.

AGRICULTURE. The United States is the leading country of the world in the output of farm products, including live stock. It is characteristic of the people to invent and employ laborsaving machinery in working the land and in harvesting the crops. The natural result of this tendency has been to greatly increase the cultivated area. Much has been done by the government with this end in view, especially in that it has protected inventors by the granting of patents. Many swamp districts have been drained with the aid of the several states, or locally by counties, and both the national and state governments have expended large sums of money to irrigate lands which are naturally too dry for the germination and maturity of crops. Another prolific source has been through the maintenance of schools of agriculture, which have greatly facilitated adapting the crops as well as methods of cultivation to the peculiarities of various localities. This means has been especially useful in adapting the cultivation of certain species of rice and cotton in the South, in promoting agriculture by dry farming in the arid regions, and in extending the corn belt farther north and west than it was formerly supposed that this cereal could be grown profitably. Much has been done to extend the cultivation of the sugar beet, to promote interest in cultivating Kaffir corn and macaroni wheat in the arid regions, and to obtain species of fruits which are suitable to the different climatic conditions

The capital invested in agriculture, including all interests for general farming and stock raising, is approximately \$24,500,000,000, or four times the amount invested in manufacturing enterprises. According to the government reports, the farms average 146.6 acres. They are smallest in the North Atlantic and largest in the Western States, being 96.5 in the former and 386.1 acres in the latter. The number of farms is placed at 5,750,000, of which about 70 per cent. are worked by their owners. Iowa stands first in the per cent, of the total land area included in farms, which is 97.4 per cent., but in this respect it is followed closely by Illinois, Ohio, and Indiana. The largest scope of cultivated land is in the valley of the Mississippi, where the

greatest interests are vested in practically every branch of farming, but various products are raised in large quantities on the Atlantic coast and on the Pacific slope. Gardening and orcharding are distinctive features of farming in the East, sugar cane and cotton culture in the South, tobacco in the central part of the Mississippi valley, cereals and hay in the Northwest, and fruits and cereals on the Pacific slope. Stock raising is a prolific enterprise in nearly all parts of the country, but the larger ranches are on the great plains, from the Gulf of Mexico to the border of the Dominion.

CEREALS. Corn is the leading cereal grown in the United States and the crop usually ranges from 2,250,000,000 to 2,650,000,000 bushels per year. Illinois, Iowa, Kansas, Missouri, Nebraska, Indiana, and Ohio are the leading corn-producing states. Oats and wheat are next to corn in the number of bushels produced, each yielding from 500,000,000 to 675,000,000 bushels per year. North Dakota, Minnesota, Kansas, South Dakota, California, Nebraska, and Indiana are the principal wheat-producing states. However, this cereal can be grown successfully in every State in the Union. About half of the product is spring wheat. Iowa, Illinois, and Wisconsin are the leading oats-producing states and the total yield of the country is nearly two-thirds of the product of the world. Barley usually yields about 132,500,000 bushels per year and is grown most extensively in California, Minnesota, and Wisconsin. Rice is an important crop in South Carolina, Texas, Louisiana, North Carolina, and Georgia. The annual yield is placed at 350,-500,000 pounds. Rye is used less extensively as a food than in Europe, hence the amount cultivated is comparatively much less than that of other important food products. Other cereals include buckwheat, Kaffir corn, and spelt.

FRUITS. Fruit culture has developed more rapidly within the last decade than in any previous time in the history of the country. This is due chiefly to the fact that much of the product is transported in refrigerator cars, by which it has become possible to serve the semitropical fruits in a good condition on the table in the northern sections. Apples are grown more extensively than all other fruits combined and mature in nearly every part of the country, but the largest orchards are in New York, Virginia, Pennsylvania, and the central part of the Mississippi valley, especially in Missouri and Illinois. Peaches take rank as the second crop and are grown in large orchards of the South, in the vicinity of the Great Lakes, and on the Pacific coast. Grapes of a fine quality thrive in New York and California and pineapples and oranges are grown extensively in Florida. Strawberries, raspberries, and blackberries are cultivated in most parts of the country. Large interests are vested in cultivating English walnuts, figs, almonds, lemons, and apricots, especially in California. Other fruits grown more or less ex-

2972

tensively include peaches, quinces, pears, bananas, and cherries.

COTTON AND TOBACCO. The United States is the leading cotton-growing country of the world and has large tracts of land which are suitable for the cultivation of sea island and other standard species. The cotton belt extends throughout the South, from Kentucky to the Gulf and from the Atlantic to the western part of Texas. From 12,500,000 to 14,500,000 bales, of 500 pounds each, are produced per year. The yield in Texas is greater than that of any other State. Other cotton-producing states include Georgia, Mississippi, South Carolina, Alabama, Arkansas, and Oklahoma. On the other hand, Kentucky is the leading tobacco-producing State, though this distinction was long maintained by Virginia and later by North Carolina. Besides the three states already mentioned, others producing large quantities of tobacco are Wisconsin, South Carolina, Pennsylvania, New York, Maryland, and Connecticut. The yield ranges from 625,500,000 to 725,500,000 pounds per year and the value of the output usually approximates \$55,500,000. Both cotton and tobacco are peculiar as economic products in that they furnish employment to an unusually large number of

OTHER CROPS. Hay is one of the leading products in all parts of the country. Among the chief species of grasses grown for hay are timothy, native grasses, clover, alfalfa, millet, and red top. Potatoes stand at the head of the list among the vegetables, but the yield is not large as compared to that of the leading countries of Europe. More attention is given to this crop in the North than in any other section, especially in Minnesota, Wisconsin, Michigan, and New York. While the crop grown in the South is not materially large, it is important that a larger part of it is shipped to supply the early market in the North. Flax is grown extensively for seed in North Dakota, Minnesota, Wisconsin, and other states of the North. Hops is cultivated on the Pacific slope and in New York. Sweet corn, tomatoes, and other crops of this kind are grown on large tracts in the East, especially in Delaware and New Jersey, where they are either marketed or canned. Other crops of importance are sugar cane, hemp, peas, beans, melons, sweet potatoes, celery, sugar beets, onions, and cab-

LIVE STOCK. The interests in stock raising are very extensive and, as compared with crop growing, they are much more important than in the countries of Europe. Cattle are the leading domestic animals and they are grown both for meat and dairy purposes. Farming as a whole is diversified in the country in general, but stock raising is largely an exclusive business in the arid region where cattle, sheep, and horses are the number of cattle, while Iowa and Illinois states in the swine industry. Large dairying interests are maintained in New York, Iowa, Illinois, Wisconsin, Ohio, and New England. Kentucky is noted for its breeding farms of driving horses. The Northwest has a reputation for the industry of rearing Clydesdale and Percheron breeds for draft purposes. Mules are grown more extensively in the South than any other section of the country, being used more extensively in that section for draft purposes than elsewhere. The sheep industry is largely represented in all sections and the breeds are mostly merino and southdowns. Ohio and Texas formerly held first rank, but the leading place is now credited to Montana, and large interests in this enterprise are vested in Wyoming Idaho, and New England. Other domestic animals include goats and poultry, especially chickens, turkeys, ducks, and geese. Ostrich farming is promoted to some extent in California. The value of all live stock is placed at \$3,500,000,000, of which the larger part is invested in cattle, swine, and horses.

MANUFACTURES. The United States ranks as the most important manufacturing country of the world, and the value of the output is greater than that of Germany and over a third larger than that of Great Britain. This is accounted for principally by the fact that the American people are not only inventive, but have at their command the natural resources necessary to promote this enterprise. The large quantities of coal, iron, timber, farm produce, and other materials, together with extensive water power and vast shipping facilities, are the causes that contributed to the development of many large industrial enterprises. Another factor is the fac that interstate commerce is absolutely unre stricted by a tariff or other influences that would tend to localize the market. Prior to the Civi War the manufacturing interests were confine almost exclusively to the East, partly becaus the transportation facilities were not develope in the West and South, but more recently th condition has been vastly revolutionized. A though the East still has a majority of the greater enterprises, it may be said that tl larger factories are distributed generally in the towns and cities of the entire country. Georg and Alabama have made remarkable strides developing the cotton and iron industries, wh North Carolina, South Carolina, and Kentuc maintain a high place in the manufacture of co ton textiles. Developments in similar lines ha been made in the West and the Northwest, est cially in such cities as Chicago, Saint Pa Minneapolis, Saint Louis, Denver, Seattle, a San Francisco.

The leading manufactures include flour : grist, cured and packed meat, iron and st lumber and lumber products, cotton and woc textiles, leather products, paper and pa pulp, and machinery. In the iron and steel dustry it holds first rank. The annual out of iron is 16,775,000 metric tons, while the

put of steel is 13,780,000 metric tons. Germany more nearly approaches the output in this industry than any other country, producing 9,500,000 metric tons of steel and 10,225,000 metric tons of pig iron per year. Pennsylvania stands at the head of the iron and steel industry. Other states that take high rank in this enterprise include Ohio, Illinois, and Indiana, in the order named. The manufacture of cotton goods is centered largely in New England, but in this section Massachusetts has the largest annual output. Other states, not included in New England, that have large cotton mills are Alabama, Georgia, North Carolina, and South Carolina. Woolens and carpets are made chiefly in Massachusetts, Pennsylvania, and Rhode Island, and silk textiles are produced in large quantities in Pennsylvania and New Jersey.

Slaughtering and meat packing are represented largely in the central west, owing to the convenience in shipping live stock to the packing-house centers. Chicago is unapproached by any other city in the world in the slaughtering and meat-packing enterprise. Other cities that rank high in this industry are Kansas City, South Omaha, Saint Louis, and Saint Joseph. About five-sixths of the product are sold fresh, being transported to markets in refrigerator cars, and the remainder is cured, though the proportion of cured pork is much greater than that of beef. Lumber and lumber products are obtained in various sections, especially in Minnesota, the Pacific slope, and the South. However, the paper industry is centered chiefly in New England, Pennsylvania, New York, and Wisconsin. Leather is made more extensively in Pennsylvania than any other State, but Massachusetts holds first rank in the output of boots and shoes. Though important as a shipbuilding country, it is exceeded in this respect by both Germany and Great Britain. However, in the production of farming machinery it surpasses every other country.

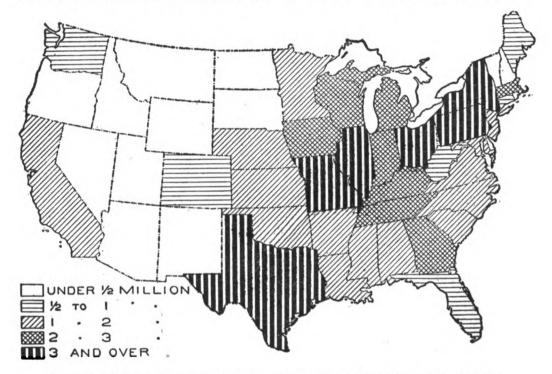
The output of dairy products has increased very rapidly with every decade and the returns from fresh milk, cheese, and canned milk are extensive. In this industry and a number of others, there has been a marked tendency to combine and operate the enterprises either on the basis of cooperation or by large corporations. The United States is second only to Germany in the value of chemical and allied products. It produces large quantities of clocks, needles, pins, musical instruments, and hardware. In printing and publishing it ranks high, especially in the output of daily newspapers, magazines, and standard books. The periodicals published have a value of \$228,500,000, while book and job products aggregate \$141,-250,000. New York City has the largest daily newspapers, but the publishing interests are well distributed throughout the larger cities. Pottery, tile, glass, brick, and tobacco products are ma-terially large. Other general manufactures include dyestuffs, explosives, fertilizers, paints and varnishes, rubber goods, and malt and distilled liquors

COMMERCE. In the volume of commerce the United States takes third rank, the aggregate value of all exports and imports being exceeded only by those of Germany and Great Britain. In 1913 the total exports were represented in value at \$1,518,561,720, this being the largest volume of exportation by any country of the world, and in the same year the exports of Germany were \$1,250,000,000 and those of Great Britain were \$1,470,000,000. In the same year the imports aggregated in value \$1,117,512,629, while the imports of Germany aggregated \$1,550,000,000 and those of Great Britain \$2,645,000,000. However, in the volume of the total trade, both foreign and domestic, the United States has the first place. Before the war the foreign trade in the order of value was with Great Britain, Germany, and France. Among the chief imports are India rubber, valued at \$53,189,711; chemicals and drugs, \$64,693,560; silk, \$93,654,593; and sugar, \$97,645,449. The chief exports include domestic animals, \$46,728,281; copper manufactures, \$86,225,291; breadstuffs, \$107,732,910; iron and steel, \$134,727,921; and unmanufactured cotton, \$379,965,014. In the decade from 1890 to 1900 the agricultural products of the United States increased 25 per cent.; mining products, 51 per cent.; and manufactures, 198 per cent. This material enlargement of production is the best explanation for an increasing trade, though there has been a noticeable effect commercially by the tariff laws of France, Germany, and other countries competing with the United States in the commerce of the world.

TRANSPORTATION. The transportation facilities surpass those of any of the leading nations. Besides its 24,500 miles of navigable rivers and interior and coastal waters, the country has the most extensive network of railroads in the world. Numerous canals are maintained to facilitate transportation. The canals utilized most extensively are the Welland Canal (Canadian), around the Falls of Niagara; the Erie Canal, connecting the Hudson and Lake Erie; the Chicago Drainage Canal, extending from Lake Michigan at Chicago; the Saint Mary's Canal, at Sault Sainte Marie, Michigan; and the Miami Canal, in Ohio. At present the railroad lines are given at about 260,690 miles, many of them double-track, making sufficient mileage to encircle the earth about ten times. It is estimated that one passenger is injured to 175,000 carried on the railways and one killed to every 2,267,250 passengers conveyed. The capital stock of all railroads is \$8,276,524,380; the gross earnings, \$2,590,550,000; and the net earnings, \$604,-,013,895. Electric railways are in operation in all the cities with a population of about 10,000 or more. These are generally connected with suburban and interurban lines, the latter conveying passengers, mail, express, and freight.

The highways of the United States are not constructed and maintained by the national government, though formerly some roads of this class received attention. Among these was the Cumberland Road, a national highway from Maryland to Illinois. At present the maintenance of highways is a local enterprise, chiefly by townships and in other cases by counties. Generally the roads are well platted and worked by grading, but they are not improved as extensively by macadam as is the case in Europe.

85,986 were Japanese; 119,050, Chinese; 266,760, Indians; and 8,840,789, Negroes. The colonial possessions had a population of 8,972,655, thus giving the nation a total population of 85,276,042. In 1910, according to the Federal census, the United States, exclusive of Alaska and the colonies, had a population of 91,972,266. Washington, D. C., on the Potomac River, is the capital. In 1910 fifty cities had a population over 100,000, as is shown in the table below. The states in which the cities are located are-indicated by the contrac-



2974

May to show the Relative Population of the States. Six States—that is, Illinois, Missouri, New York, Ohio, Pennsylvania, and Texas—have over 3,000,000 Inhabitants.

In some sections, especially where the soil is rich and the rainfall is large, the roads get quite muddy and in a bad condition during the rainy season. Communication by telephone and telegraph is general throughout the country, and telephone lines are utilized extensively even in many sparsely settled districts. Express lines are operated generally in connection with railways and steamboat transportation, while the postal system is managed by the government. Practically all the cities with a population of 8,000 have free delivery and rural free delivery routes are maintained in the more densely settled country districts, though this branch of the postal system is not as well represented as in European countries.

POPULATION. The census of 1900 accords the United States, including Alaska, a population of 76.303,387. This embraces a total colored population of 9,312,585, or 12.2 per cent., of which

tions or abbreviations of their names as generally used in writing or printing:

сіту.	STATE.	POPULA- TION.
New York	N. Y	4,766,883
Chicago	III	2,185,283
Philadelphia	Pa	1,549,008
Saint Louis	Mo	687,029
Boston	Mass	670,585
Cleveland	O	560,663
Baltimore	Md	558,485
Pittsburg	Do.	533,905
Detroit	Pa	
Detroit		465,766
Buffalo		423,715
San Francisco	Cal	416,912
Milwaukee	Wis	373,857
Cincinnati	0	364,463
Newark	N. J	347,469
New Orleans	La	339,075
Washington	D. C	331,009
Los Angeles	Cal	319,198
Minneapolis	Minn	301,408
Jersey City	Ñ. J	267,779
Kansas City	Mo	248,381
Seattle	Wash	237,194
Indianapolis	Ind	233,650

Population-Continued.

CITY.	STATE.	POPULA- TION.
Providence	R. I	222,326
Louisville	Ky	223,928
Rochester		218,149
Saint Paul		214,744
Denver		213,381
Portland		207,214
Columbus		181,548
		168,497
Toledo		154,839
Atlanta		150,174
Oakland		
Worcester		145,986
Syracuse		137,249
New Haven		133,605
Birmingham	Ala	132,685
Memphis		131,105
Scranton	Pa	129,867
Richmond	Va	127,628
Paterson	N. J	125,600
Omaha	Neb	124,096
Fall River		119,295
Dayton		116,577
Grand Rapids		112,571
Nashville		110,364
Lowell.		106,294
Cambridge		104,839
		104,402
Spokane		102,054
Bridgeport		

INCREASE IN POPULATION.—At the time of the Revolutionary War about one-fifth of the people were of foreign birth, but the greatest number of immigrants in any one year came to the country in 1903, when 857,046 foreigners landed at the ports. In that year the largest number of immigrants came from Italy, Russia, Sweden-Norway, Germany, and Ireland. However, the American people are made up largely from the descendants of Germans, English, Irish, Scotch, French, Scandinavians, in the order named. The immigrants from Western Europe have been numerous throughout the existence of the Republic, but more recently, especially since 1890, large numbers have come from Italy, Poland, Greece, and the Balkan states. At the time of the first census, in 1790, the center of population was 23 miles east of Baltimore, Md. Since then there has been a constant movement toward the West, to which both the people of the United States and Europe have been attracted by larger opportunities in acquiring land and advantages in various industrial enterprises. However, the population of the cities has increased more rapidly than that of the country, and this is true in nearly every decade of national growth. The following table contains the entire population at the time of each national census, together with the number and the per cent. of the

YEAR.	POPULATION.	POPULATION LIVING IN CITIES.	INHABITANTS OF CITIES IN EACH 100 OF THE TOTAL POPULATION.
1790	3,929,214	131,472	3.35
1800	5,308,483	210.873	3.97
1810	7,239,381	356,920	4.93
1820	9,633,822	475.135	4.93
1830	12.866,020	1.864.509	6.72
1840	17,069,453	1.453.994	8.52
1850	23,191,876	2,897,586	12.49
1860	31,443,321	5,072,256	16.13
1870	38,558,371	8,071,875	20.93
1880	50,155,783	11,318,547	22.57
1890	62,622,250	13,284,385	29.20
1900	76,303,387	30,797,185	40.50
1910	91,972,266	42,623,383	46.30

LANGUAGE. English is the spoken and the official language. In 1900 there were 1,403,212 persons over ten years of age who were unable

to speak English, but the number who can use other languages is vastly larger. Those who are unable to use the national language consist principally of Italians, Hebrews, Poles, Chinese, and Indians. Among the leading languages spoken aside from the English are German, French, Italian, Spanish, Polish, Scandinavian, Slovak, and Hebrew. However, the system of State schools maintained everywhere facilitates learning the English very rapidly, especially by the young. Another element contributing to the use of one language is the fact that no large scope of country anywhere is populated exclusively by a single race, but instead all races are quite generally distributed, or are freely intermixed. People of British and German descent are found in all sections of the country, while the Scandinavians are confined largely to the Northwest, the Hebrews to the larger cities, the Spanish to the Southwest, the French to Louisiana and some sections of the East, and the Greeks and Italians to the manufacturing and industrial centers. The English spoken differs in accent very noticeably from that of England and is somewhat characterized by local peculiarities, as the distinguishing form of expressions heard in New England and in the South. However, the printed form and the language as taught in the schools are absolutely uniform.

GOVERNMENT. The government of the United States is administered through three distinct and separate branches. These are the legislative, or lawmaking power; the executive, or law-inforcing power; and the judicial, or law-interpreting power. The legislative branch is vested in the Congress, which consists of a Senate and House of Representatives; the executive, in a President; and the judicial, in the Federal courts of law. After the United States secured its independence, from 1778 until 1789, the states were governed by the Articles of Confederation, which provided a government unsatisfactory to the newly formed and developing country. Accordingly the present Constitution was devised and adopted by a constitutional convention that met at Philadelphia, Pa., on May 25, 1787. George Washington was president of the convention and the new Constitution was adopted by that body on Sept. 17, 1787. It went into effect on March 4, 1789. Since then seventeen amendments have been made to the Constitution. The gold dollar, comprised of 100 cents, is the standard monetary unit.

EXECUTIVE DEPARTMENT. The President is the chief executive, and he is succeeded by the Vice President in case of death or removal by impeachment. Both are elected for a term of four years by the people through an electoral college, formed in each State, and composed of electors equaling the number of senators and representatives sent by the State to Congress. The President, who has his residence at the White House in Washington, D. C., receives a

salary of \$75,000 a year. His general duties are to execute the laws. Though he is commander in chief of the army and navy of the United States, he does not appear at the head of these departments. He may conclude treaties by and with the consent of the Senate, make nominations and appointments for public offices, inform Congress of the state of the Union by messages, and convoke Congress in special session. While he may veto measures enacted by Congress, yet a bill may be passed by a two-thirds vote in each house of Congress and become a law without his sanction.

The Vice President is president of the Senate and receives a salary of \$12,000 per year. Both the President and Vice President are eligible to office under the same conditions; namely, that they are born within the jurisdiction of the United States, have attained to the age of 35 years, and have been 14 years resident within the United States. In case both the President and Vice President die or are removed by conviction on impeachment, the cabinet officers succeed to the Presidency in the following order: Secretary of State, of the Treasury, of War, Attorney-General, Postmaster-General, Secretary of the Navy, and Secretary of the Interior.

The presidents of the United States are treated in special articles, but the following is a com-

plete, tabulated list:

NAMES.	ELECT- ED FROM	PARTY.	DATE OF INAUGURA- TION.
George Washington	Va.	Federalist.	April 30, 1789
John Adams	Mass.	Federalist.	March 4, 1797
Thomas Jefferson	Va.	Democrat.	March 4, 1801
James Madison	Va.	Democrat.	March 4, 1809
James Monroe	Va.	Democrat.	March 4, 1817
John Quincy Adams. {	Mass.	National- Republican.	March 4, 1825
Andrew Jackson	Tenn.	Democrat.	March 4, 1829
Hartin Van Buren	N. Y.	Democrat.	March 4, 1837
Wm. H. Harrison	Ohio	Whig.	March 4, 1841
John Tyler	Va.	Whig.	April 6, 1841
James K. Polk	Tenn.	Democrat.	March 4, 1845
Zachary Taylor	La.	Whig.	March 5, 1849
Millard Fillmore	N.Y.	Whig.	July 9, 1850
Franklin Pierce	N. H.	Democrat.	March 4, 1853
James Buchanan	Pa.	Democrat.	March 4, 1857
Abraham Lincoln	I11.	Republican.	March 4, 1861
Andrew Johnson	Tenn.	Democrat.	April 15, 1865
Ulysses S. Grant	III.	Republican.	March 4, 1869
Rutherford B. Hayes	Ohio.	Republican.	March 5, 1877
James A. Garfield	Ohio.	Republican.	March 4, 1881
Chester A. Arthur	N.Y.	Republican.	Sept. 20, 1881
Grover Cleveland	N. Y.	Democrat.	March 4, 1885
Benjamin Harrison	Ind.	Republican.	March 4, 1889
Grover Cleveland	N. Y.	Democrat.	March 4, 1893
William McKinley	Ohio	Republican.	March 4, 1897
Theodore Roosevelt	N.Y.	Republican.	Sept. 14, 1901
William H. Taft	Ohio.	Republican.	March 4, 1909
Woodrow Wilson	N. J.	Democrat	March 4, 1913

The President is assisted in the discharge of his duties by ten cabinet officers, who are the heads of the different departments of the government. These include secretaries of State, of the Treasury, of War, of the Interior, of the Navy, of Agriculture, of Commerce, of Labor, Postmaster-General, and Attorney-General. Among the chief duties of these officials are to advise with the President and make reports to him relative to the state of affairs in their respective departments. Their general duties are discussed under United States De-

partments of, which see. The salary is \$12,000 per year and the term of office is dependent upon the incumbency of the President, who appoints them subject to approval by the Senate.

Below is a complete list of the vice presidents, together with the presidents serving at the same time, and to the right are the years of their birth and death:

VICE-PRESIDENTS.	FROM	PRESIDENT.	BORN.	DIED
John Adams	Mass.	Washington.	1735	1826
Thomas Jefferson	Va.	John Adams.	1743	1826
Aaron Burr	N. Y.	Jefferson.	1756	1836
George Clint n	N. Y.	Jefferson and Madison.	1739	1812
Elbridge Gerry	Mass.	Madison.	1744	1814
Daniel D. Tompkins	N. Y.	Monroe.	1774	1825
John C. Calhoun	S. C.	J. Q. Adams.	1782	1850
Martin Van Buren	N. Y.	Jackson.	1782	1862
Richard M. Johnson	Ky.	Van Buren.	1780	1850
John Tyler	Va.	Harrison.	1790	1862
George M. Dallas	Penn.	Polk.	1792	1864
Millard Fillmore	N.Y.	Taylor.	1800	1874
William R. King	Ala.	Pierce.	1786	1853
John C. Breckenridge	Ky.	Buchanan.	1821	1875
Hannibal Hamlin		Lincoln.	1809	1891
Andrew Johnson	Tenn.	Lincoln.	1808	1875
Schuyler Colfax	Ind.	Grant.	1823	1895
Henry Wilson	Mass.	Grant.	1812	1875
William A. Wheeler	N.Y.	Hayes.	1819	1887
Chester A. Arthur	N. Y.	Garfield.	1830	1886
Thomas A. Hendricks.	Ind.	Cleveland.	1819	1885
Levi P. Morton	N.Y.	Harrison.	1824	1000
Adlai E. Stevenson	Ill.	Cleveland.	1835	1222
Garrett A. Hobart	N. J.	McKinley.	1844	1899
Theodore Roosevelt	N.Y.	McKinley.	1858	
Charles W. Fairbanks.		Roosevelt.	1852	
James S. Sherman	N. Y.	Taft.	1855	1912
Thomas R. Marshall	Ind.	Wilson	1854	

LEGISLATIVE DEPARTMENT. Congress is composed of senators, two of whom are elected by the Legislature of each State, and of representatives, who are chosen by the electors of the several states, the number depending upon the population. At present the Senate is constituted of 96 members and the House of 435 members. This makes the basis of representation in the House 211,430, but each State is entitled to at least one representative. See Congress

least one representative. See Congress.

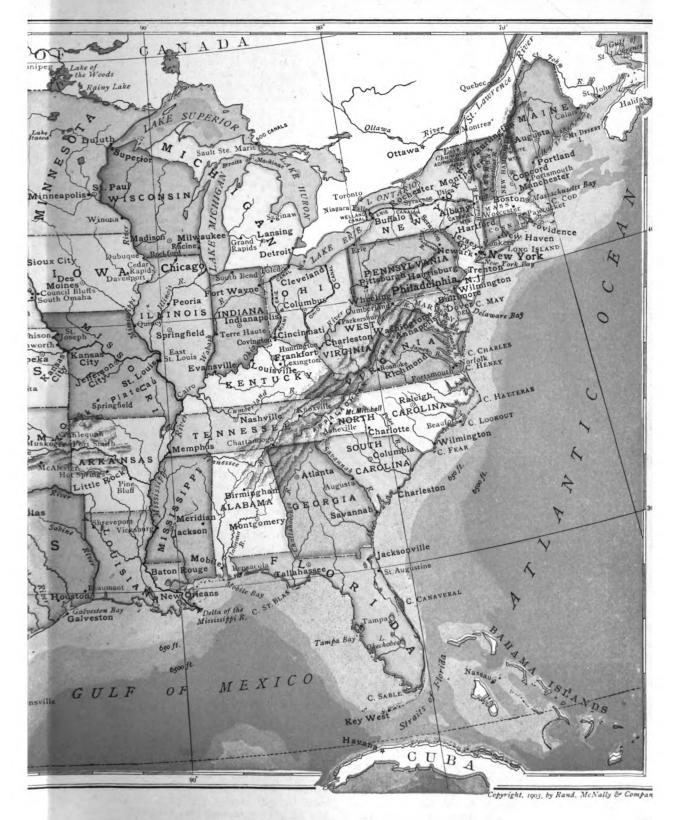
JUDICIAL DEPARTMENT. The judicial department of the national government is vested in a Supreme Court, having a chief justice and eight associate justices, and in the circuit courts of appeal, circuit courts of the United States, district courts of the United States, and the supreme court of the District of Columbia. Congress has power to establish and organize all the courts except the Supreme Court, which is established by the Constitution, and the judges of these courts are nominated by the President subject to confirmation by the Senate. The government of each State, like that of the nation, is composed of the three departments, executive, legislative, and judicial, most of the State officers being elective by the people. See City; County; State.

ARMY AND NAVY. The inilitary forces of the United States have varied considerably within recent years, owing to the war with Spain and a number of garrisons that are maintained in the colonies. At present the peace footing, including the colonial troops, is limited to 225,000

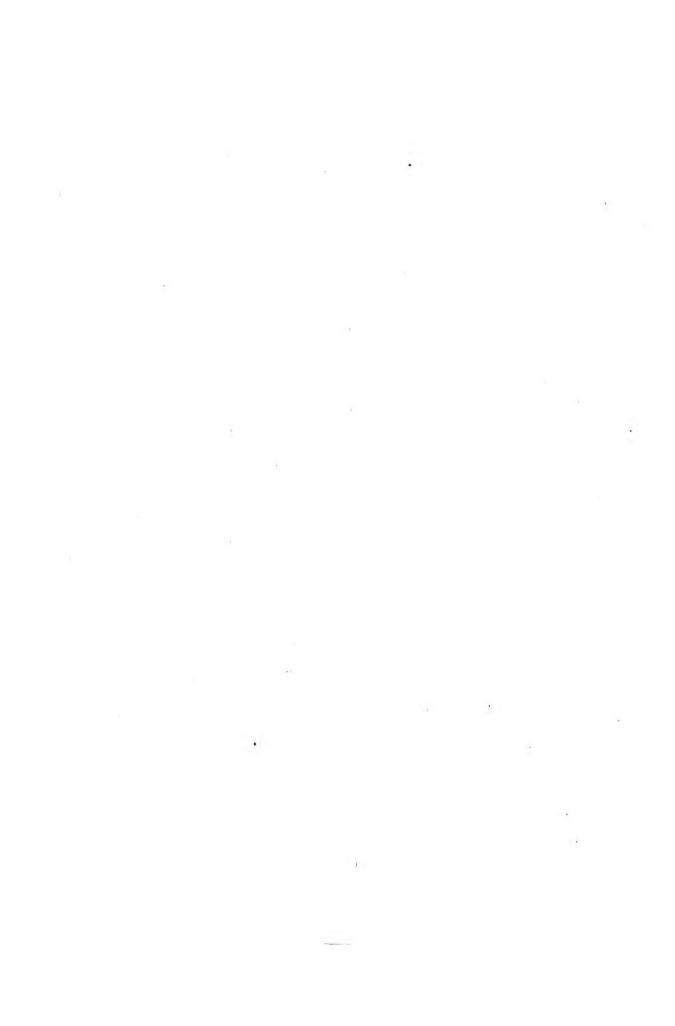
		at.
	4 1	
*	7	



(Art. United States)



S Co.



men; in 1917, under the conscription law, 11,035,-614 men were registered. In addition to the national army there is a militia in the different states. All able-bodied men between the ages of 21 and 45 years are liable to military duty in case of emergency. The navy has been materially increased within recent years and now consists of 25,000 men and about 200 vessels. It includes 40 battleships, fifteen protected cruisers, seventy destroyers, twelve monitors, thirty torpedo boats, fifty submarines, and a number of vessels of different minor classes. The Krag-Jorgensen rifle has been used largely in the army, but it has been superseded by the Springfield model of 1903. The President is the commander of both the army and the navy. See

United States Military Academy. EDUCATION. The educational affairs of the United States are largely under the direction of the several states. In this respect the public schools are quite like the statal system of Germany. Each State has a system of elementary and public high schools. The State institutions of higher learning are maintained by taxation and appropriations under the laws of the respective states. The elementary schools have courses of study in all grades from the kindergarten to the high school, while the high schools are designed to prepare for the higher institutions, and the latter fit for entrance into the university. A superintendent of public instruction or a commissioner of education, assisted by county and city superintendents, has general supervision of the educational affairs of the State. In each State are a number of very excellent private denominational and sectarian colleges, and in many of them universities, supported either wholly or in part by endowments. However, the national government has made liberal appropriations for the support of universities, industrial schools, and institutions disseminating knowledge in agriculture and mechanical arts. The support given by the national government to these institutions includes 75,000,-000 acres of the public domain, besides appropriations made by Congress from the public funds. Similar public grants have been made to support a naval and military academy, two institutions of public interest constituting the only ones under direct supervision of the national government

The Bureau of Education is maintained under the Department of the Interior, of which the Commissioner of Education is the chief officer, whose duty is to diffuse information and gather statistics. He publishes from time to time reports upon educational questions, makes public addresses, and issues circulars relative to interests connected with public intelligence. The Signal Service Bureau, the Smithsonian Institution, a national observatory, and commissions to make scientific inquiry and historical research are maintained by the nation. Special commissions to make geographical, geological, and

naval surveys and explorations are other enterprises supported by the national government. The educational interests are at present in the highest state of development in the regions of the Central West. This is true especially in the rudiments of education and educational arts, while the lowest ebb in public instruction prevails in some of the Southern States, a condition to be expected after the long enslavement of the Negroes. However, the impetus resulting from the long period of prosperity since the Civil War, which extended from 1861 to 1865, is fast displacing the barriers and promulgating intelligence. Attendance upon public schools is alike free to all. A limited compulsory attendance law is on the statute books of most of the states, requiring attendance usually from the age of eight to fourteen years. In a number of the Southern States separate schools are maintained for the children of white and colored families.

LITERATURE. See American Literature.

Religion. The free exercise of religious belief and worship is guaranteed by the Constitution of the United States and by the constitutions of the individual states. However, it is made obligatory to observe one weekly holiday by refraining from pursuing the ordinary avocations, but individuals are given the right to observe either Sunday or Saturday as the Sabbath. Practically all the religious denominations of the world are represented, the actual church membership being 40,120,000. The proportion of Protestants to Roman Catholics is about four to one. The numerical order of the larger bodies is approximately in the following order: Roman Catholics, Methodists, Baptists, Lutherans, Presbyterians, Disciples of Christ, Episcopalians, Congregationalists, Latter Day Saints, German Reformed, United Brethren, German Evangelical, Jews, Universalists, Friends, Greek Catholics, Christian Scientists, and Spiritualists. Many institutions of secondary and higher learning are maintained by the religious bodies.

POLITICAL DIVISIONS. The United States proper consists of forty-eight States and the District of Columbia. Besides these is Alaska, which is organized as a Territory. Many of the State boundary lines are formed by rivers, lakes, and other natural lines of demarkation. For this reason they are somewhat irregular, only four divisions cornering at the same point, these being Colorado, Utah, Arizona, and New Mexico. Each State is guaranteed a republican form of government by the national Constitution, and is limited in various respects by that fundamental law in its general rights and powers. Below is a complete list of the states in the order in which they came into the Union, the first thirteen named being the original states, hence the date given is that on which the Constitution was ratified. The numbers to the right represent the number of electors to which the states are entitled, which are equal to the two

senators and the several representatives sent by the states to the national Congress:

о.	NAMES OF STATES.	DATES OF RATIFICATION OR ADMISSION.	CAPITALS.	ELEC-
	Delaware	Dec. 7, 178	7 Dover	3
	Pennsylvania	Dec. 12, 178		38
	New Jersey	Dec. 18, 178		14
				14
	Georgia	Jan. 2, 178		19
	Connecticut	Jan. 9, 178		
	Massachusetts	Feb. 6, 178		18
	Maryland	Apr. 28, 178		8
	South Carolina	May 23, 178		9
	New Hampshire.	June 21, 178		4
	Virginia	June 25, 178	8 Richmond	12
	New York	Jul. 26, 178	8 Albany	4
	North Carolina	Nov. 21, 178	Raleigh	13
	Rhode Island	May 29, 179		
	Vermont	Mar. 4, 179		- 4
	Kentucky	June 1, 179		1.
	Tennessee	June 1, 179		î
		Feb. 19, 180		2
	Ohio			
	Louisiana	Apr. 30, 181		1
	Indiana	Dec. 11, 181		1
	Mississippi	Dec. 10, 181		1
	Illinois	Dec. 3, 181		2
	Alabama	Dec. 14, 181	9 Montgomery	1
	Maine	Mar. 15, 182	0 Augusta	
	Missouri	Aug. 10, 182	1 Jefferson City.	1
	Arkansas	June 15, 183		1.5
	Michigan	Jan. 26, 183		1
	Florida	Mar. 3, 184		1
	Texas	Dec. 29, 184		2
	Iowa	Dec. 28, 184		lĩ
	Wissensia	May 29, 184		i
	Wisconsin			li
	California			
	Minnesota	May 11, 185		1
	Oregon	Feb. 14, 185		
	Kansas	Jan. 29, 186		1
	West Virginia	Jun. 19, 186	3 Charleston	
	Nevada	Oct. 31, 186	4 Carson City	
	Nebraska	Mar. 1, 186	7 Lincoln	3
	Colorado	Aug. 1, 187		
	North Dakota	Nov. 2, 188		
	South Dakota	Nov. 2, 188		
	Montana	Nov. 8, 188		
	Montana			
	Washington	Nov. 11, 188		
	Idaho	Jul. 3, 189		
	Wyoming	Jul. 10, 189		
	Utah	Jan. 4, 189	6 Salt Lake City	
	Oklahoma	Nov. 16, 190	7 Oklahoma City	1
	New Mexico	Jan. 6, 191		100
	Arizona	Feb. 14, 191		
	TELLEVILLE	A CU. AT, 171		-

Alaska, purchased of Russia in 1867 and organized as a territorial government in 1884, is a Territory. It has a delegate representative to Congress, who may speak upon questions, but is not allowed a vote in that body. The government is administered in the territories by a Territorial Legislature chosen by popular vote, but the Governor is nominated by the President, subject to approval by the Senate. Congress has direct charge of the District of Columbia, and those residing within its boundary are not privileged to take part in the national elections. The colonies are governed similarly to the territories and have local privileges as to the management of affairs pertaining to education, internal improvements, and other matters of local interest. The states and the surveyed portions of territories are divided into counties, usually consisting of sixteen townships, and each township consisting of 36 sections. A section of land comprises 640 acres, which is again subdivided into quarters or smaller divisions. Congress has power to admit new states formed from territory of the United States. The admission of a Territory as

a State is dependent mainly upon its population and apparent ability to support a State government and maintain its authority.

The table below contains a list of the states, together with their area and population:

NO.	NAME.	SQUARE MILES.	POPULA- TION, 1910
1	Alabama	52,250	2,138,09
2	Arizona	113,020	204,354
3	Arkansas	53,850	1,574,449
4	California	158,360	2,377,54
5	California.		799,02
	Colorado	103,925	1,114,75
6	Connecticut	4,990	202.32
7	Delaware	2,050	752.61
8	Florida	58,680	2,609,12
9	Georgia	59,475	325,59
10	Idaho	84,800	£ 620 E0
11	Illinois	56,650	5,638,59
12	Indiana	36,350	2,700,87
13	Iowa	56,025	2,224,77
14	Kansas	82,080	1,690,94
15	Kentucky	40,400	2,289,90
16	Louisiana	48,720	1,656,38
17	Maine	33,040	742,37
18	Maryland	12,210	1.295,34
19	Massachusetts	8,315	3,366,41
20		58,915	2,810,17
21			2,075,70
	Minnesota	83,365	1,797,11
22	Mississippi	46,810	3,293,33
23	Missouri	69,415	376.05
24	Montana	146,080	
25	Nebraska	77,510	1,192,21
26	Nevada	110,700	81,87
27	New Hampshire	9,305	430,57
28	New Jersey	7,815	2,537,16
29	New Mexico	122,580	327,30
30	New York	49,170	9,113,61
31	North Carolina	52,250	2,206,28
32	North Dakota	70,795	577,05
33	Ohio,	41,060	4.767,12
34	Oklahoma	70.057	1,657,15
35	Oregon	96,030	672,76
36	Pennsylvania	45,215	7,665,11
37	Rhode Island	1,250	542,61
38	South Carolina	30,570	1,515,40
39	South Dakota	77,650	583.88
		42,050	2,184,78
40	Tennessee		3,896,54
41	Texas	265,780	373,35
42	Utah	84,970	3/3,3
43	Vermont	9,565	355,9
44	Virginia	42,450	2,061,6
45	Washington	69,180	1,141,9
46	West Virginia	24,780	1,221,1
47	Wisconsin	56,040	2,333,80
48	Wyoming	97,890	145.9

HISTORY. The history of the United States in a wider sense dates from the discovery of America by Christopher Columbus, who set foot upon land in the new world on Oct. 12, 1492. However, it is reasonable to assume that earlier discoveries were made by Norsemen and Scandinavians. Eric the Red, a Norseman, is thought to have discovered Greenland in 985. Lief Ericsson, son of Eric the Red, sailed from Norway to Iceland in 1000 and the following year came to the northeastern coast of North America. These discoveries are mentioned in the Sagas, but little accurate knowledge can be obtained of them, aside from the fact that America was visited by these navigators, though their discoveries and explorations bore no material fruit. Owing to this, it is safe to assume that American history dates from 1492, though Columbus did not visit the mainland of North America. Sebastian Cabot, an English explorer, cruised along the northeastern coast of North America in 1498, exploring it from Virginia to Labrador. Ponce de León landed near Saint Augustine, Fla., in 1513, and penetrated inland in search of a fountain that had the power to confer perpetual youth upon those who would partake of its water.

COLONIZATION. The first settlements within the region now included in the United States were made by the Spaniards. They built forts and founded colonies at Saint Augustine in 1565, and at Santa Fé, N. M., in 1605. The earliest permanent English settlement was made at Jamestown, Va., in 1607, under the direction of the London Company. Soon after, in 1613, the Dutch settled at New York, then called the New Netherlands, and the Massachusetts Colony at Plymouth was established in 1620. French explorers penetrated to the region of the Great Lakes and the Mississippi, the latter being explored by La Salle in 1682. Permanent settlements were made soon after at Kaskaskia, Ill., and Mobile, Ala. The Swedes had colonies on the Delaware and Hudson, but they were deprived of their lands by the Dutch in 1655, when they were compelled to surrender to an army sent from New Amsterdam, now New York City.

Subsequently the English and Dutch became involved in boundary disputes, giving rise to serious trouble between the two claimants, and the Duke of York, in 1664, captured the Dutch possessions, annexing them to those of the English. This resulted in the claims to territory in America being limited to the English, Spanish, and French. The Spanish settlements were confined to the southeastern part; the French settlements extended to the northeastern region and the territory contiguous to the Great Lakes and the Mississippi; while the English claims extended from Florida to Nova Scotia. Steadily the English extended their settlements toward the interior, pressing before them the Indians and confining the Spanish and French to narrower limits. However, the English colonies were not united by any ties of material effect until 1688, when settled and uniform relations were established.

The Treaty of Utrecht, in 1713, gave a monopoly of the slave trade to England, which, since the reign of Elizabeth, had imported slaves from Africa into the colonies of America and the West Indies. It likewise gave England possession of Acadia, which long had been an object of contention with the French. King George's War, known in Europe as the War of the Austrian Succession, witnessed the loss of Louisburg to the French, but the Treaty of Aix-la-Chapelle ceded it back to France. The French and Indian War was the next contest for supremacy. The English under Braddock sustained a defeat at Fort Duquesne in 1755, but the tide of war turned in their favor, and General Wolfe with an English army defeated the French under General Montcalm in a decisive battle on the Plains of Abraham, near Quebec, on Sept. 13, 1759. Both generals fell in the battle, but it was the engagement that lost Canada and the Atlantic coast to the French. As a result France

ceded all the lands east of the Mississippi to England, thus giving that country possession of all the eastern part of North America north of Florida and Louisiana.

COLONIAL GOVERNMENT. The English possessions of North America, which are at present included in the United States, were divided into thirteen colonies, each coinciding more or less with the states now bearing their names. These colonies were Delaware, Pennsylvania, Georgia, New Jersey, Massachusetts, Connecticut, South Carolina, Maryland, Virginia, North Carolina, New York, Rhode Island, and New Hampshire. The government of the colonies was administered by England through a resident governor and other officers appointed by the crown. However, the government was administered under the general theory that the colonies belong to the mother country as a matter of right and may exercise no commercial or political right, except such as may be granted to them by the home government. This theory, although it was accepted by the leading nations at that time, was the occasion of much contention in America, where the sturdy pioneers began to assert a spirit of unrest and revolution. Finally, being burdened by excessive taxation, which the English levied to aid in defraving the expenses of the war with the French, the col nies gradually became dissatisfied and beg: 1 to organize for establishing an independent government.

REVOLUTIONARY WAR. When the colonists resisted the policy of the home government, they were met by retaliatory measures, such as were designed to compel obedience to the laws. These hastened the events that caused the Revolutionary War. A number of garrisons were established in the meantime by the British and the colonists were taxed to support them. Other causes of the Revolution included the Importation Act of 1733, the Writs of Assistance in 1761, and the Stamp Act of 1765. These led to the Tea Party, the Boston Massacre, and an order issued to General Gage commanding that force should be used in subduing the colonists. Petitions for redress were sent in vain to George III. and on Sept. 5, 1774, the First Continental Congress met in Philadelphia. This assemblage made a declaration of rights, but the British Parliament obstinately refused to make concessions.

The first hostilities between the continentals and the British regulars broke out on April 19, 1775, at Lexington, and soon after the colonists were defeated at Bunker Hill. On May 10, 1775, the Second Continental Congress convened at Philadelphia and made provisions for securing the united action of the colonies. It again petitioned the king and British people for redress, but provided for actual war and selected George Washington as commander in chief for the defense of American liberty. The Declaration of Independence was adopted by a unanimous vote

on July 4, 1776, and that document named the country the United States of America. Most of the seaport cities were captured by the British, but the Americans held the interior and recaptured some of the cities. The first decisive battle and the one which is considered the turning point of the war occurred at Saratoga, Oct. 17, 1777, when General Burgoyne surrendered

with a large army to General Gates.

The colonists were assisted by a number of French, German, and Polish officers, and French troops came to their assistance. Cornwallis was pressed by Washington and Lafayette and finally surrendered at Yorktown on Oct. 19, 1781, thus ending the war. Peace was concluded in November, 1782, and the final treaty of peace was signed at Versailles, France, on Sept. 3, 1783, by which Great Britain formally acknowledged the independence of the United States. Counting from the Battle of Lexington to the official proclamation of the cessation of hostilities, in 1783, the Revolutionary War extended over a period of eight years. The American troops engaged in the Revolution included 232,000 regular soldiers and 55,500 militia, while the British had an army of 115,000 men and officers and a navy of 22,500 men. About 5,000 French soldiers fought on the American side, and further assistance was given to the colonists by an alliance between Spain and France against England. The British had a navy of 130 vessels and many transports, while the Americans had only seventeen vessels at the beginning of the war. However, Paul Jones and other privateers captured a number of British vessels and almost destroyed the British commerce.

INDEPENDENT GOVERNMENT. As soon as the colonies obtained an independent government they turned their attention to organizing civil institutions and developing internal resources. The Articles of Confederation, adopted in 1777, soon proved unsatisfactory and movements were organized for obtaining a more stable plan of government. In 1787 the Constitution was prepared, which went into effect March 4, 1789. The preamble to that document declares its object, and is as follows: "We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquillity, provide for the common defense, promote the general welfare, and secure the blessings ings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America." The first Congress under the Constitution met April 6, 1789, and on April 30 of the same year George Washington Preside and John Adams were inaugurated as President and Vice President. England, humiliated by display iated by defeat in America, continued to display a spirit of hostility. That country claimed the right of searching American ships and impressing into the ing into the British service persons who had formerly been British subjects.

WAR OF 1812. A second war between the two

countries was formally declared by the United States on June 18, 1812, but the Americans had already captured a large number of British ships and sailors. It is generally spoken of in history as the War of 1812. The vessels of the Americans were superior to those of their opponents and destroyed the maritime supremacy of Great Britain within a year. Two unsuccessful invasions of Canada, in 1812, were followed by a successful invasion under Generals Ripley and Scott in 1814, who captured Chippewa and administered a partial defeat to the British at Lun-The British attempted an invasion dy's Lane. by way of Lake Champlain, but they were defeated. However, they successfully ascended Chesapeake Bay, defeated the Americans at Bladensburg, and on Aug. 24, 1814, captured Washington. Greater success crowned the Americans in the naval contest, especially on the Great Lakes, where Commodore Perry destroyed a British fleet and captured 63 guns. The war ended by the Treaty of Ghent, signed on Dec. 24, 1814, but the last battle occurred on Jan. 8, 1815, at New Orleans, where General Jackson defeated the British under General Pak-That battle was a severe loss to the British and was fought before any information of the peace treaty reached the United States.

MEXICAN WAR. The war with Mexico was the next military contest to engage the United States. It was caused partly by the United States annexing Texas in 1845 and partly by a boundary dispute between Mexico and the new terri-Texas had previously been a part or Mexico, but had been organized as an independent republic, and a Mexican army crossed the Rio Grande on April 26, 1845, to maintain Mexican authority. The Mexicans were met by an American army under General Taylor, who displayed much vigor in their pursuit, defeating them at Palo Alto, Monterey, and Saltillo, and finally subduing them at Buena Vista on Feb. 23, 1847. Another army under Scott landed at Vera Cruz, which was captured March 29, 1847, and the American army rapidly pushed forward to Contreras, Churubusco, and the City of Mexico, which was captured on Sept. 14, 1847. The treaty of peace, signed Feb. 2, 1848, made the Rio Grande the boundary, and ceded New Mexico and California to the United States.

SLAVERY. Early in the history of the country the feeling between the political parties was more or less pronounced, at first between the Federalists and the Anti-Federalists, and later between the former and the more vigorous Democratic party. However, the successful administration of James Madison removed many questions from controversy and gave rise to the Era of Good Feeling. Later the rise of the Whig party again divided the people into two great political organizations and forced many issues of commerce, transportation, finance, and inter-

nal improvement to the front.

In the meantime the feeling became intense on the question of slavery extension. In the Northern States, where slavery was both unpopular and unprofitable, the sentiment against its extension, and even retention, was decidedly strong, while the Southern States advocated the enlargement of the slave-holding territory with the view of maintaining the balance of political power. Slavery had been introduced as early as 1619, when a Dutch vessel brought the first slaves to the colonies, and the slave trade from African ports was long an important source of revenue. The traffic in slaves had been abolished in the United States in 1808, but the question at issue was whether to maintain slavery in the states where it was already recognized as an institution and to extend it to new territories. The acquisition of California and New Mexico intensified the contest, since the Northern States were pronounced in their opposition to making the new territory a slave-hold-

ing region. CIVIL WAR. The Civil War, extending from 1861 to 1865, finally spread like a vast cloud over the land. It may be assigned to various causes. Prominent among them were the extension of slavery, differences in industrial interests, and a lack of intercourse between the people of the North and the South. John Brown's raid on Harper's Ferry in 1859 had already caused great excitement throughout the Union, which was further intensified by local war in Kansas and the election of Abraham Lincoln to the Presidency. Eleven of the Southern States promptly seceded from the Union and established the Confederate States of America (q. v.). Jefferson Davis, of Mississippi, was elected President and Alexander H. Stephens, of Georgia, became Vice President of the new government. The southern authorities immediately prepared for war by seizing valuable stores and blockading Fort Sumter, in Charleston harbor. President Lincoln declared in his inaugural address, March 4, 1861, that the Southern States were afforded no ground for apprehending any invasions of their rights by the election of a Republican administration and took immediate steps to maintain the Union. The first shot of the war was fired against the granite walls of Fort Sumter on April 12, 1861, and two days later the commanding officer, Major Anderson, surrendered to General Beauregard, but he was permitted to sail with his garrison to New York.

The armed contest for the maintenance of the Union is one of the most sanguinary in the history of the world. President Lincoln issued a proclamation on April 15, 1861, calling for 75,000 men for three months. It was the general opinion that the war would be of short duration, but the people of the Southern States responded to the call to arms with characteristic alacrity and fought with remarkable bravery, thus extending the contest about four years. The number of men enrolled in the Union army at different

times included 2,775,500, while the army was largest on May 1, 1865, when it consisted of 1,000,516 men. The Confederate troops numbered 692,000. It is estimated that the total number of deaths exceeded 512,000, of which 318,000 belonged to the Federal army. The losses of both Federal and Confederate soldiers in the greatest battles were as follows: Shiloh, 27,000; Chancellorsville, 31,000; Stone River, 37,000; Antietam, 38,000; Gettysburg, 53,000; McClellan's peninsular campaign, 50,000; Sherman's campaign, 125,000; and Grant's peninsular campaign, 180,000. The war closed with the surrender of General Lee at Appomattox, Va., April 9, 1865. On Jan. 1, 1863, President Lincoln issued the emancipation proclamation to free the slaves. Other incidents of interest in the war include the unfriendly spirit shown by England to the success of the Union cause, the loss of hundreds of merchantmen and other vessels, and the construction and successful use of the Monitor. The war paralyzed the industries of the Southern States and caused the national debt to reach \$2,756,431,571 on Aug. 1, 1865, which was its highest point.

RECONSTRUCTION. President Lincoln and Congress anticipated the problems involved in bringing the seceded states back into the Union and establishing responsible and loyal governments in the same. In fact reconstruction began to be discussed as early as 1863, although the period involved in this feature of the Civil War properly extends from the close of the conflict of arms in 1865 until the withdrawal of the Federal troops from the Southern States in 1877. Lincoln having been assassinated, in 1865, the Vice President, Andrew Johnson, became the chief executive. The latter adopted the lenient policy of Lincoln in the issues of reconstruction, but new questions arose and at length estranged him from a majority in Congress. Accordingly he was impeached and subjected to an extended trial before the Senate, where a single vote saved him from conviction. Congress in the meantime proposed the Thirteenth Amendment to the Constitution, abolishing slavery, which was ratified by the requisite number of states in December, 1865. In the same year both houses of Congress proposed the Fourteenth Amendment, which, after much discussion, was ratified in July, 1868. This provides that all persons born or naturalized in the United States, and subject to the jurisdiction thereof, shall be deemed to be citizens of the United States and the State where they reside. Congress finally passed the Tenure of Office Bill, over the veto of the President, as a restriction to limit the chief executive in his power of removal from office. However, the President removed Stanton as Secretary of War and appointed Lorenzo Thomas in his stead, considering that Congress had invaded the constitutional rights of the President. This was the direct cause of the impeachment proceedings. Other features of

the period include the carpetbaggers' (q. v.) government in the South, the Ku Klux Klan (q. v.), and the building of the Pacific railroads. The eleven states which had seceded were readmitted to the Union as follows: Tennessee in 1866; Alabama, Arkansa, Florida, Georgia, Louisiana, North Carolina, and South Carolina in 1868; and Mississippi, Texas, and Virginia in 1870. In 1877, in the administration of President Hayes, the remaining troops were withdrawn from the South.

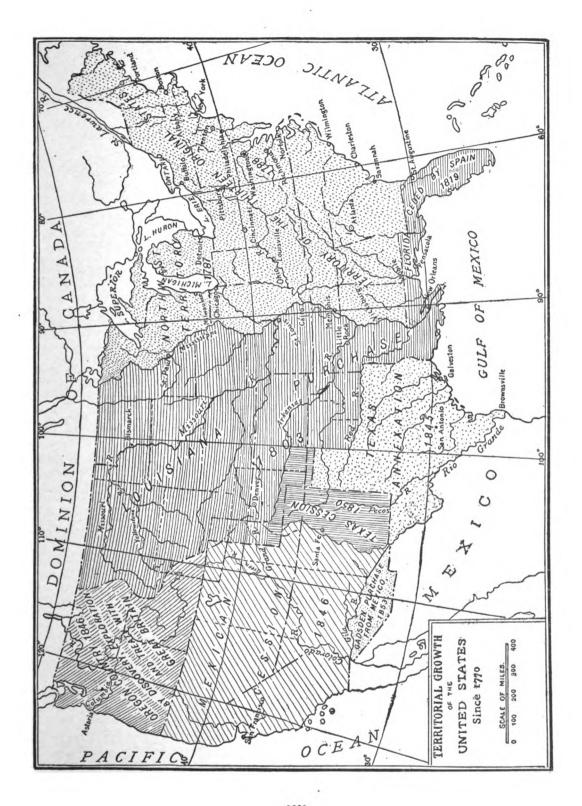
NATIONAL DEVELOPMENT. The subsequent history of the United States records remarkable growth in population and wealth. It is an epoch of development in industries and educational enterprises. Not only were the seceded states reconstructed as members of the Union, but all feeling of sectionalism has passed away. It has witnessed greater commercial and social intercourse between the two sections than were maintained at any other time in the history of the country, which has resulted in welding enduring ties of sympathy and sentiment.

SPANISH-AMERICAN WAR. No military contest occurred in the period from 1865 until the beginning of the Spanish-American War, in 1898. This war was the outgrowth of Spanish oppression in Cuba and Porto Rico, where a war for independence had been waged for many years. Naturally sympathetic for the people struggling for independence, the Americans were greatly aroused by the destruction of the battleship Maine with its crew of 262 men, in Havana harbor, by a torpedo mine, on Feb. 15, 1898. Congress passed a bill on April 25 declaring that a state of war existed between the United States and Spain and that it had so existed since and including April 21.

The first shot of the Spanish-American war was fired on April 22 by the gunboat Nashville, which captured the Spanish ship Buenaventura off the coast of Florida. It may be said that the short and decisive contest was one of battleships, in which the United States demonstrated remarkable efficiency as a naval power. Commodore Dewey destroyed the Spanish fleet in Manila Bay, in the Philippines, and Commodore Schley located the most powerful fleet of Spain, that under command of Admiral Cervera, in Santiago harbor. The latter was blockaded by the American ships off the harbor entrance, including the Iowa, New York, Brooklyn, Indiana, Oregon, Texas, Marblehead, and New Orleans. Admiral Cervera made a well-directed effort to escape from the harbor into the open sea, but the Americans under the direct command of Commodore Schley, the commanding officer, Commodore Sampson, being temporarily absent, captured or destroyed every Spanish vessel. Among the battles fought by the army are those under General Lawton at El Caney, Cuba, on July 1, and that of San Juan Hill on the same date under General Wheeler and General Hawkins, the whole expedition being commanded by General Shafter. These battles compelled the capitulation of the Spanish army under General Toral at Santiago, which was surrendered on July 17. Peace was concluded by the Treaty of Paris on Dec. 10, 1898, which ceded Porto Rico and the Philippines to the United States and recognized the right of Cuba to establish an independent government, the United States paying Spain \$20,000,000 in consideration of the latter country relinquishing its claims to the Philippines.

PHILIPPINE INSURRECTION. A large party in the Philippines being hostile to American annexation, an independent government was established by the insurgent Filipinos on June 12, 1898, of which Aguinaldo was made president. The Philippine republic was proclaimed three weeks later and a general address was issued, which consisted in part of an appeal to the European powers for official recognition. Hostilities between the American troops under General Otis and the insurgents became active and a desultory guerrilla warfare was inaugurated l.v. the Filipinos. At the close of 1899 the United States had 2,051 officers and 63,483 men in the service against the insurgents. With this force it was possible to clear central Luzón of effective Filipino soldiery and the islands toward the south were occupied with more or less dispatch. Major General Lawton was killed in action in December, 1899, and subsequently severe skirmishes occurred in Luzón and Mindanao. Maj. Gen. Arthur McArthur was made commander in chief of the Philippines in 1900, and on May 5 of that year published an amnesty proclamation to affect those surrendering to the United States authority. However, hostilities of more or less importance continued until March 23, 1901, when Aguinaldo was captured by a detachment of the United States army under Gen. Frederick Funston. It may be said that this capture ended armed opposition in the archipelago. For the political history see the article on Political Parties in the United STATES.

TERRITORIAL EXPANSION. The territorial growth of the United States has been constant. the nation emerging from all its military contests with signal success. At the time of the peace treaty that concluded the war of independence, in 1783, the territorial expanse was 827,844 square miles. Thomas Jefferson negotiated the Louisiana Purchase in 1803, thus adding 1,171,931 square miles. Florida was purchased of Spain in 1819, the region ceded under this purchase containing 59,368 square miles. With the annexation of Texas, in 1845, 376,133 square miles were added, and the Mexican cession of 1848 increased the national domain by 545,783 square miles. The Gadsden Purchase, a tract of land lying south of the Gila River, was secured from Mexico in 1853 in consideration of \$10,000,000. It embraces an area of 45,535 square miles. Alaska, containing 590,884



square miles, was purchased of Russia in 1867 for \$7,200,000.

COLONIES. The chief colonial possessions of the United States are Porto Rico, Hawaii, and the Philippines, all of which are treated in

special articles, which see.

Guam, the largest of the Ladrone Islands, was ceded to the United States by the treaty at Paris in 1898. It is located 900 miles from Manila and 5,200 miles from San Francisco. It has an area of 150 square miles. Spanish is the prevailing language. The inhabitants are mostly immigrants from the Philippines, and the rate of illiteracy is placed at ten per cent. Tropical fruits, sugar cane, and rice are the chief products.

Wake Island, a small tract of land lying on the route between Hawaii and Japan, about 2,000 miles from the former and 3,000 miles from the latter, was claimed for the United States by Commander Taussig, of the Bennington, in 1899. With it are included a number of small islands of rocky or coral reef formation and the larger part is uninhabited.

Tutuila, one of the Samoan Islands, was ceded to the United States in 1899 in a treaty concluded with Germany and Great Britain. It has an area of 54 square miles and a population of 5,800 inhabitants. Pago-Pago, the chief town, is considered the most valuable island harbor in the entire Pacific ocean. This harbor could hold the entire naval force of the United States. The coaling station, being surrounded by high bluffs, is safe from shells thrown from the outside. Being located on a direct line from San Francisco to Australia and about 2,200 miles from Hawaii, the possession is of value commercially as a station.

In 1904 a tract of land was acquired from the republic of Panama, known as the Panama Canal Zone. This grant was made in perpetuity for the construction and maintenance of the Panama Canal and extends from the Caribbean Sea to the Pacific Ocean. It includes a total of 474 square miles, embracing the small islands in the Bay of Panama, known as Culebra, Flamingo, Nacs, and Perico. The Virgin Islands, formerly known as the Danish West Indies, were purchased of Denmark in 1917 for \$25,000,000.

World Power. The birth of the United States may be said to date from the discovery of Columbus in 1492. Although more than 100 years elapsed from that time until the permanent settlements were established along the coast of the Atlantic, the few scattered settlements soon grew to become thirteen regularly constituted colonies. This is the simple story of the early and primitive communities that have since developed into a nation of forty-six states, several territories, and a group of colonial possessions, constituting at present one of the foremost political and industrial powers of the world. The lofty principles which underlie the government and the notable achievements in the his-

tory of the nation are proof that the country has in store still greater achievements for the future. No better display of national intelligence was ever made than that exhibited in the World's Columbian Exposition at Chicago in 1893, the Louisiana Purchase Exposition at Saint Louis, in 1904, and a number of smaller but notable exhibitions of more recent dates. The nation stands among the foremost in wealth, in educational achievements, in commercial enterprise, and in industrial development. These and many other factors, such as the building of the Panama Canal and its attainments in diplomacy, are factors that make the country noted as a world power.

UNITED STATES, Constitution of the, the basic or fundamental law of the United States of America. It is the organic law that unites the states and binds them into a perpetual Union. All the laws of the nation and of the several states are subordinate to the Constitution of the United States, and any law made by a legislative body within its jurisdiction must be in accord with the basic law, otherwise it is void and inoperative. The Constitution is preceded by the preamble and consists of seven original articles and sixteen articles of amendment. It was adopted on Sept. 17, 1787, by a constitutional convention held in Independence Hall, Philadelphia, and went into effect on March 4, 1789. The full text is as follows:

CONSTITUTION OF THE UNITED STATES.

We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquillity, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America.

ARTICLE I.

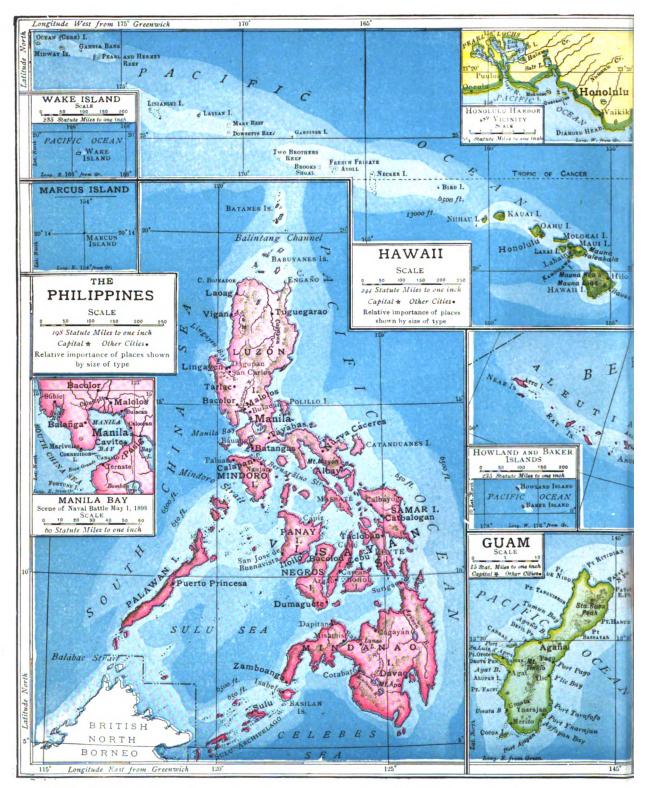
Section 1.—All legislative powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives.

SEC. 2.—The House of Representatives shall be composed of members chosen every second year by the people of the several states, and electors in each State shall have the qualifications requisite for electors of the most numerous branch of the State Legislature.

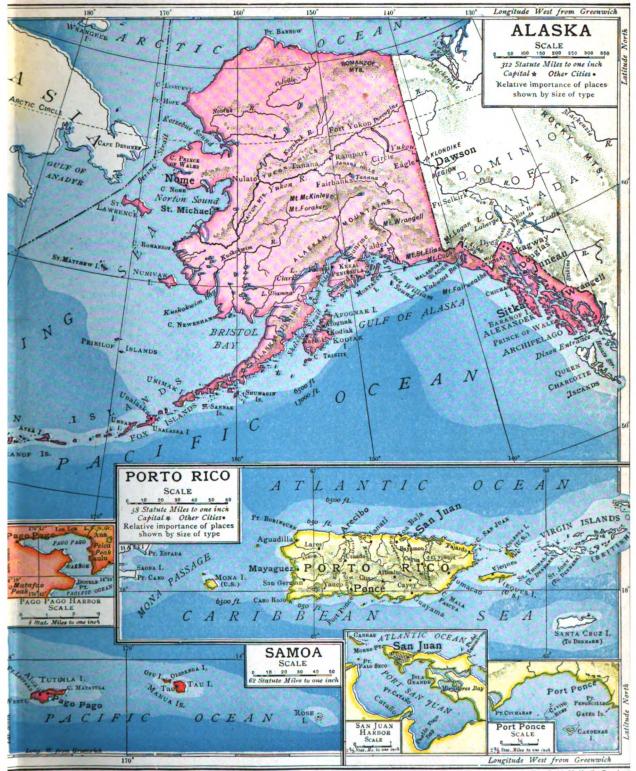
No person shall be a representative who shall not have attained the age of twenty-five years, and been seven years a citizen of the United States, and who shall not, when elected, be an inhabitant of that state in which he shall be chosen.

Representatives and direct taxes shall be apportioned among the several states which may be included within this Union, according to their respective numbers, which shall be determined by





(Art. United States)



Copyright, 1903. by Rand, McNally & Company





adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, threefifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law di-The number of representatives shall not exceed one for every thirty thousand; but each State shall have at least one representative; and until such enumeration shall be made, the state of New Hampshire shall be entitled to choose three, Massachusetts, eight, Rhode Island and Providence Plantations, one, Connecticut, five, New York, six, New Jersey, four, Pennsylvania, eight, Delaware, one, Maryland, six, Virginia, ten, North Carolina, five, South Carolina, five, and Georgia, three.

When vacancies happen in the representation from any State, the executive authority thereof shall issue writs of election to fill such

The House of Representatives shall choose their speaker and other officers; and shall have the sole power of impeachment.

SEC. 3.—The Senate of the United States shall be composed of two senators from each State, chosen by the Legislature thereof, for six years; and each Senator shall have one vote.

Immediately after they shall be assembled in consequence of the first election, they shall be divided, as equally as may be, into three classes. The seats of the senators of the first class shall be vacated at the expiration of the second year, of the second class, at the expiration of the fourth year, and of the third class, at the expiration of the sixth year, so that one-third may be chosen every second year; and if vacancies happen, by resignation or otherwise, during the recess of the Legislature of any State, the executive thereof may make temporary appointments until the next meeting of the Legislature, which shall then fill such vacancies.

No person shall be a Senator who shall not have attained to the age of thirty years, and been nine years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State for which he shall be chosen.

The Vice President of the United States shall be President of the Senate, but shall have no vote unless they be equally divided.

The Senate shall choose their other officers, and also a president *pro tempore*, in the absence of the Vice President, or when he shall exercise the office as President of the United States.

The Senate shall have the sole power to try all impeachments. When sitting for that purpose, they shall be on oath or affirmation.

When the President of the United States is tried, the Chief Justice shall preside; and no person shall be convicted without the concurrence of two-thirds of the members present.

Judgment, in cases of impeachment, shall not

extend further than to removal from office, and disqualification to hold and enjoy any office of honor, trust, or profit under the United States; but the party convicted shall, nevertheless, be liable and subject to indictment, trial, judgment, and punishment, according to law.

SEC. 4.—The times, places, and manner of holding elections for senators and representatives shall be prescribed in each State by the Legislature thereof; but the Congress may, at any time, by law, make or alter such regulations, except as to the places of choosing senators.

The Congress shall assemble at least once in every year; and such meeting shall be on the first Monday in December, unless they shall by law appoint a different day.

SEC. 5.—Each house shall be the judge of the elections, returns, and qualifications of its own members; and a majority of each shall constitute a quorum to do business; but a smaller number may adjourn from day to day, and may be authorized to compel the attendance of absent members, in such manner and under such penalties as each house may provide.

Each house may determine the rules of its proceedings, punish its members for disorderly behavior, and, with the concurrence of twothirds, expel a member.

Each house shall keep a journal of its proceedings, and from time to time publish the same, excepting such parts as may in their judgment require secrecy; and the yeas and nays of the members of either house, on any question, shall, at the desire of one-fifth of those present, be entered on the journal.

Neither house, during the session of Congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two houses shall be sitting.

Sec. 6.—The senators and representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the treasury of the United States. They shall, in all cases except treason, felony, and breach of the peace, be privileged from arrest during their attendance at the session of their respective houses, and in going to and returning from the same; and, for any speech or debate in either house, they shall not be questioned in any other place.

No Senator or Representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States which shall have been created, or the emoluments whereof shall have been increased, during such time; and no person holding any office under the United States shall be a member of either house during his continuance in office.

Sec. 7.—All bills for raising revenue shall originate in the House of Representatives; but the Senate may propose or concur with amendments, as on other bills.

Every bill which shall have passed the House of Representatives and the Senate, shall, before it becomes a law, be presented to the President of the United States; if he approve he shall sign it, but if not he shall return it, with his objections, to that house in which it shall have originated, who shall enter the objections at large on their journal, and proceed to reconsider it. If after such reconsideration, two-thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered, and, if approved by twothirds of that house, it shall become a law. But in all such cases, the votes of both houses shall be determined by yeas and nays; and the names of the persons voting for and against the bill shall be entered on the journal of each house respectively. If any bill shall not be returned by the President within ten days (Sundays excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the Congress by their adjournment prevent its return, in which case it shall not be a law.

Every order, resolution, or vote, to which the concurrence of the Senate and House of Representatives may be necessary (except on a question of adjournment), shall be presented to the President of the United States; and, before the same shall take effect, shall be approved by him, or, being disapproved by him, shall be repassed by two-thirds of the Senate and House of Representatives, according to the rules and limitations prescribed in the case of a bill.

SEC. 8.—The Congress shall have power:—

To lay and collect taxes, duties, imposts, and excises, to pay the debts, and provide for the common defense and general welfare, of the United States; but all duties, imposts, and excises shall be uniform throughout the United States:

To borrow money on the credit of the United States:

To regulate commerce with foreign nations, and among the several states, and with the Indian tribes:

To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States:

To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures:

To provide for the punishment of counterfeiting the securities and current coin of the United States:

To establish post offices and post roads:

To promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries:

To constitute tribunals inferior to the Supreme Court:

To define and punish piracies and felonies committed on the high seas, and offenses against the law of nations:

To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water:

To raise and support armies; but no appropriation of money to that use shall be for a longer term than two years:

To provide and maintain a navy:

To make rules for the government and regulation of the land and naval forces:

To provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions:

To provide for organizing, arming and disciplining the militia, and for governing such part of them as may be employed in the service of the United States, reserving to the states respectively, the appointment of the officers, and the authority of training the militia according to the discipline prescribed by Congress.

To exercise exclusive legislation, in all cases whatsoever, over such district (not exceeding ten miles square) as may, by cession of particular states, and the acceptance of Congress, become the seat of government of the United States, and to exercise like authority over all places purchased by the consent of the Legislature of the State in which the same shall be, for the erection of forts, magazines, arsenals, dockyards, and other needful buildings:—And

To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the government of the United States, or in any department or office thereof.

Sec. 9.—The migration or importation of such persons as any of the states now existing shall think proper to admit, shall not be prohibited by the Congress prior to the year one thousand eight hundred and eight; but a tax, or duty, may be imposed on such importation, not exceeding ten dollars for each person.

The privilege of the writ of habeas corpus shall not be suspended, unless when in cases of rebellion or invasion the public safety may require it.

No bill of attainder or ex post facto law shall be passed.

No capitation or other direct tax shall be laid, unless in proportion to the census, or enumeration, hereinbefore directed to be taken.

No tax or duty shall be laid on articles exported from any State. No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another; nor shall vessels bound to or from one State be obliged to enter, clear, or pay duties, in another.

No money shall be drawn from the treasury but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them shall, without the consent of the Congress, accept of any present, emolument, office or title of any kind whatever, from any king, prince, or foreign state.

Sec. 10.—No state shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make anything but gold and silver coin a tender in payment of debts; pass any bill of attainder, ex post facto law, or law impairing the obligations of contracts; or grant any title of nobility.

No State shall, without the consent of the Congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts laid by any State on imports or exports, shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and control of the Congress. No State shall, without the consent of Congress, lay any duty of tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another State or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay.

ARTICLE II.

SECTION 1.—The executive power shall be vested in a President of the United States of America. He shall hold his office during the term of four years, and together with the Vice President, chosen for the same term, be elected as follows:—

Each State shall appoint, in such manner as the Legislature thereof may direct, a number of electors equal to the whole number of senators and representatives to which the State may be entitled in the Congress; but no Senator or Representative, or person holding an office of trust or profit under the United States, shall be appointed an elector.

The electors shall meet in their respective states, and vote by ballot for two persons, of whom one, at least, shall not be an inhabitant of the same State with themselves. And they shall make a list of all the persons voted for, and of the number of votes for each; which list they shall sign and certify, and transmit sealed to the seat of the government of the United States, directed to the President of the Senate. The President of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates; and the votes shall then be counted. The person having the greatest number of votes shall be the President, if such number be a majority of the whole number of electors appointed; and if there he

more than one who have such majority, and have an equal number of votes, then the House of Representatives shall immediately choose, by ballot, one of them for President; and if no person have a majority, then, from the five highest on the list the said house shall, in like manner, choose the President. But, in choosing the President, the votes shall be taken by states; the representation from each State having one vote; a quorum for this purpose shall consist of a member or members from two-thirds of the states; and a majority of all the states shall be necessary to a choice. In every case, after the choice of the President, the person having the greatest number of votes of the electors shall be the Vice President. But if there should remain two or more who have equal votes, the Senate shall choose from them, by ballot, the Vice President. (This clause has been superseded by Amendment XII.)

The Congress may determine the time of choosing the electors, and the day on which they shall give their votes; which day shall be the same throughout the United States.

No person, except a natural born citizen, or a citizen of the United States at the time of the adoption of this Constitution, shall be eligible to the office of President; neither shall any person be eligible to that office who shall not have attained to the age of thirty-five years, and been fourteen years a resident within the United States.

In case of the removal of the President from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the Vice President; and the Congress may, by law, provide for the case of removal, death, resignation, or inability, both of the President and Vice President, declaring what officer shall then act as President; and such officer shall act accordingly, until the disability be removed, or a President shall be elected.

The President shall, at stated times, receive for his services a compensation, which shall neither be increased nor diminished during the period for which he shall have been elected; and he shall not receive within that period any other emolument from the United States, or any of them.

Before he enter on the execution of his office, he shall take the following oath or affirmation:

"I do solemnly swear (or affirm) that I will faithfully execute the office of President of the United States and will, to the best of my ability, preserve, protect, and defend the Constitution of the United States."

SEC. 2.—The President shall be commander in chief of the army and navy of the United States, and of the militia of the several states, when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive de-

partments, upon any subject relating to the duties of their respective offices, and he shall have power to grant reprieves and pardons for offenses against the United States, except in cases

of impeachment.

He shall have power, by and with the advice and consent of the Senate, to make treaties, provided two-thirds of the Senators present concur; and he shall nominate, and by and with the advice and consent of the Senate, shall appoint, ambassadors, other public ministers, and consuls, judges of the Supreme Court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law; but the Congress may, by law, vest the appointment of such inferior officers as they think proper, in the President alone, in the courts of law, or in the heads of departments.

The President shall have power to fill up all vacancies that may happen during the recess of the Senate, by granting commissions, which shall expire at the end of their next session.

SEC. 3.—He shall, from time to time, give to the Congress information of the state of the Union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may, on extraordinary occasions, convene both houses, or either of them, and, in case of disagreement between them with respect to the time of adjournment, he may adjourn them to such time as he shall think proper: he shall receive ambassadors and other public ministers; he shall take care that the laws be faithfully executed; and shall commission all the officers of the United States.

SEC. 4.-The President, Vice President, and all civil officers of the United States, shall be removed from office on impeachment for and conviction of treason, bribery, or other high crimes and misdemeanors.

ARTICLE III.

Section 1.—The judicial power of the United States shall be vested in a Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish. The judges, both of the supreme and inferior courts, shall hold their offices during good behavior; and shall, at stated times, receive for their services a compensation, which shall not be diminished during their continuance in office.

Sec. 2.—The judicial power shall extend to all cases, in law and equity, arising under this Constitution, the laws of the United States and treaties made, or which shall be made, under their authority; to all cases affecting ambassadors, other public ministers, and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more states, between a State and citizens of another State, between citizens of different states, between citizens of the same State claiming lands under grants of different states, and between a State, or the citizens thereof, and foreign states, citizens, or subjects.

In all cases affecting ambassadors, other public ministers and consuls, and those in which a State shall be a party, the Supreme Court shall have original jurisdiction. In all the other cases before mentioned, the Supreme Court shall have appellate jurisdiction both as to law and fact, with such exceptions, and under such regulations as the Congress shall make.

The trial of all crimes, except in cases of impeachment, shall be by jury; and such trial shall be held in the State where the said crimes shall have been committed; but, when not committed within any State, the trial shall be at such place or places as the Congress may by

law have directed.

2988

SEC. 3.—Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort. No persons shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court

The Congress shall have power to declare the punishment of treason, but no attainder of treason shall work corruption of blood or forfeiture, except during the life of the person

attainted

ARTICLE IV.

Section 1.-Full faith and credit shall be given in each State to the public acts, records, and judicial proceedings of every other State. And the Congress may by general laws prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof.

Sec. 2.—The citizens of each State shall be entitled to all privileges and immunities of citizens in the several states.

A person charged in any State with treason, felony, or other crime, who shall flee from justice, and be found in another State, shall, on demand of the executive authority of the State from which he fled, be delivered up, to be removed to the State having jurisdiction of the crime.

No person held to service or labor in one State under the laws thereof, escaping into another, shall, in consequence of any law or regulation therein, be discharged from such service or labor, but shall be delivered up on claim of the party to whom such service or labor may be due.

SEC. 3.—New states may be admitted by the Congress into this Union: but no new State shall be formed or erected within the jurisdiction of any other State; nor any State be formed by the junction of two or more states, or parts of states, without the consent of the Legislature of the State concerned, as well as of the Congress.

The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any claims of the United States, or of any particular State.

SEC. 4.—The United States shall guarantee to every State in this Union a republican form of government, and shall protect each of them against invasion; and on application of the Legislature, or of the executive (when the Legislature cannot be convened), against domestic violence.

ARTICLE V.

The Congress, whenever two-thirds of both houses shall deem it necessary, shall propose amendments to this Constitution: or, on the application of the legislatures of two-thirds of the several states, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes, as part of this Constitution, when ratified by the legislatures of three-fourths of the several states, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the Congress; provided, that no amendment which may be made prior to the year one thousand eight hundred and eight shall in any manner affect the first and fourth clauses in the ninth section of the first article; and that no State, without its consent, shall be deprived of its equal suffrage in the Senate.

ARTICLE VI.

All debts contracted, and engagements entered into, before the adoption of this Constitution, shall be as valid against the United States under this Constitution, as under the confederation.

This Constitution, and the laws of the United States which shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every State shall be bound thereby, anything in the constitution or laws of any State to the contrary notwithstanding.

The senators and representatives before mentioned, and the members of the several State legislatures, and all executive and judicial officers, both of the United States and of the several states, shall be bound by oath or affirmation to support this Constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

ARTICLE VII.

The ratification of the conventions of nine states shall be sufficient for the establishment of this Constitution between the states so ratifying the same.

Done in convention by the unanimous consent of the states present, the seventeenth day of September, in the year of our Lord one thousand seven hundred and eigthy-seven, and of the independence of the United States of America the twelfth. In witness whereof we have hereunto subscribed our names.

George Washington, President, and Deputy from Virginia.

New Hampshire.—John Langdon, Nicholas Gilman.

MASSACHUSETTS.—Nathaniel Gorham, Rufus King.

CONNECTICUT.—William Samuel Johnson, Roger Sherman.

New York.—Alexander Hamilton.

New Jersey.—William Livingston, David Bearley, William Patterson, Jonathan Dayton.

PENNSYLVANIA.—Benjamin Franklin, Thomas Mifflin, Robert Morris, George Clymer, Thomas Fitzsimons, Jared Ingersoll, James Wilson, Gouverneur Morris.

Delaware.—George Read, Gunning Bedford, Jr., John Dickinson, Richard Bassett, Jacob Broom.

Maryland.—James McHenry, Daniel of St. Thomas Jenifer, Daniel Carroll.

VIRGINIA.—John Blair, James Madison, Jr. NORTH CAROLINA.—William Blount, Richard Dobbs Spaight, Hugh Williamson.

SOUTH CAROLINA.—John Rutledge, Charles Cotesworth Pinckney, Charles Pinckney, Pierce Butler.

Georgia.—William Few, Abraham Baldwin.

Attest: William Jackson, Secretary.

AMENDMENTS TO THE CONSTITUTION.

ARTICLE I.

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

ARTICLE II.

A well-regulated militia being necessary to the security of a free State, the right of the people to keep and bear arms shall not be infringed.

ARTICLE III.

No soldier shall, in time of peace, be quartered in any house without the consent of the owner; nor in time of war, but in a manner to be prescribed by law.

ARTICLE IV.

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated; and no warrants shall issue but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the person or things to be seized.

ARTICLE V.

No person shall be held to answer for a capital or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia when in actual service in time of war or public danger; nor shall any person be subject, for the same offense, to be twice put in jeopardy of life or limb; nor shall be compelled, in any criminal case, to be a witness against himself; nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.

ARTICLE VI.

In all criminal prosecutions the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor; and to have the assistance of counsel for his defense.

ARTICLE VII.

In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved; and no fact tried by a jury shall be otherwise reëxamined in any court of the United States than according to the rules of the common law.

ARTICLE VIII.

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

ARTICLE IX.

The enumeration in the Constitution of certain rights, shall not be construed to deny or disparage others retained by the people.

ARTICLE X.

The powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people.

ARTICLE XI.

The judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States, by citizens of another State, or by citizens or subjects of any foreign state.

ARTICLE XII.

The electors shall meet in their respective states, and vote by ballot for President and Vice President, one of whom, at least, shall not be an inhabitant of the same State with themselves; they shall name in their ballots the per-

son voted for as President, and in distinct ballots the person voted for as Vice President; and they shall make distinct lists of all persons voted for as President, and of all persons voted for as Vice President, and of the number of votes for each, which lists they shall sign and certify, and transmit sealed to the seat of the government of the United States, directed to the president of the Senate; the president of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates, and the votes shall then be counted; the person having the greatest number of votes for President shall be the President, if such number be a majority of the whole number of electors appointed; and if no person have such majority, then from the persons having the highest numbers, not exceeding three on the list of those voted for as President, the House of Representatives shall choose immediately, by ballot, the President. But, in choosing the President, the votes shall be taken by states, the representation from each State having one vote; a quorum for this purpose shall consist of a member or members from two-thirds of the states, and a majority of all the states shall be necessary to a choice. And if the House of Representatives shall not choose a President, whenever the right of choice shall devolve upon them, before the fourth day of March next following, then the Vice President shall act as President. as in the case of death or other constitutional disability of the President.

The person having the greatest number of votes as Vice President, shall be the Vice President, if such number be a majority of the whole number of electors appointed: and if no person have a majority, then from the two highest numbers on the list, the Senate shall choose the Vice President; a quorum for the purpose shall consist of two-thirds of the whole number of senators, and a majority of the whole number shall be necessary to a choice.

But no person constitutionally ineligible to the office of President, shall be eligible to that of Vice President of the United States.

ARTICLE XIII.

Section 1.—Neither slavery nor involuntary servitude, except as a punishment for crime, whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction.

SEC. 2.—Congress shall have power to enforce this article by appropriate legislation.

ARTICLE XIV.

SECTION 1.—All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State de-

prive any person of life, liberty, or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

Sec. 2.—Representatives shall be apportioned among the several states, according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for choice of electors for President and Vice President of the United States, representatives in Congress, the executive and judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male inhabitants of such State being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens s' ll bear to the whole number of male citizens twenty-one years of age in such State.

Sec. 3.-No person shall be a Senator, or Representative in Congress, or elector of President and Vice President, or hold any office, civil or military, under the United States, or under any State, who, having previously taken an oath as a member of Congress, or as an officer of the United States, or as a member of any State Legislature, or as an executive or judicial officer of any State, to support the Constitution of the the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof; but Congress may, by a vote of two-thirds of each house, remove such disability.

SEC. 4.—The validity of the public debt of the United States authorized by law, including debts incurred for payment of pensions, and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States, nor any State, shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations, and claims shall be held illegal and void.

ARTICLE XV.

Section 1.—The right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of race, color, or previous condition of servitude.

ARTICLE XVI.

The Congress shall have power to lay and collect taxes on incomes, from whatever sources derived, without apportionment among the states and without regard to any census or enumeration. (Article XVII requires Senators to be elected by the voters of each State.)

UNITED STATES, Departments of, the executive departments of the Union, whose chief officers comprise the Cabinet of the Presi-

established before the adoption of the Constitution, these departments did not constitute an advisory board holding the dignity of the present presidential Cabinet. A Postmaster-General had been provided in 1775 and the four executive departments of Finance, Marine, War, and Foreign Affairs were organized in 1781. Three of the present departments, those of State, War, and the Treasury, were established by the act of Aug. 7, 1789, and the other six were organized subsequently. The Post Office Department was established in 1792, the Department of the Navy in 1798, of the Interior in 1849, of Justice in 1870, of Agriculture in 1889, and of Commerce and Labor in 1903. The head of each department is appointed by the President, subject to confirmation by the Senate, and receives a salary of \$12,000 per annum. Besides supervising the important work relative to the respective departments, the cabinet officers may be required to give their opinion in writing to the President on any subject relating to the duties of their respective offices. All the departments have offices in fine, large buildings erected by the government at Washington, D. C.

DEPARTMENT OF THE TREASURY. The Treasury Department may be regarded one of the most important, since the Secretary of the Treasury is charged with the duty of preparing plans for the management and improvement of the revenue. It has charge and control, not only of all the fiscal affairs of the government, but has direct supervision of the national banks, of the customs and internal revenue systems, of the currency and coinage, and of the commercial marine. Other duties imposed upon the department include the inspection of steam vessels and of the marine hospitals, supervision of the lifesaving systems, and superintendence of printing and engraving. About 5,000 clerks and officers are employed by the department. Alexander Hamilton was the first Secretary of the Treasury, serving in that capacity from 1789 until 1795.

DEPARTMENT OF STATE. The Department of State is under the supervision of the Secretary of State. His duties are not clearly defined by law, but depend to a considerable extent upon instructions of the President. He is the medium of communication between the United States and the several states and between the nation and foreign countries. In his custody are copies of all public documents, treaties, laws, and official correspondence with foreign countries. He is the custodian of the great seal of the United States, which he affixes to all national documents requiring it, and countersigns all commissions issued by the President. The ambassadors and consuls are under the direction of this department. Citizens desiring to visit or travel in foreign countries receive passports from the Secretary of State. He presents foreign ministers to the President and authenticates all dent. Although executive departments had been proclamations issued by the chief executive. Thomas Jefferson served as Secretary of State from 1789 to 1794, being the first to fill that position.

DEPARTMENT OF WAR. The Department of War is presided over by the Secretary of War, who has superintendence of all matters relating to war or to the army, including the purchase and distribution of supplies and army transportation. He has charge of the disbursement of river and harbor appropriations and of the signal service and meteorological records. A large number of subordinate officers assist the head of the department, chief among which are the adjutant general, inspector general, paymaster general, quartermaster general, surgeon general, commissary general, chief of engineers, chief of ordnance, chief signal officer, and chief judgeadvocate general. The Secretary of War and his subordinates have custody of the various records appertaining to their duties. He is required to report to the President on the state of the army and all matters relating to their



BUILDING OCCUPIED BY THE STATE, NAVY, AND WAR DEPARTMENTS.

duties. The President is head of the army in the same sense that he is head of the nation, though he does not take command in person in case of war, yet he has the power were he so disposed. It is probably a wise plan to have the control and general operations of the army under the President, since these duties are of an executive character. The President being charged with them, he is able to act on a plan of unity and promptness in maintaining peace at home and in resisting foreign aggression. In 1789 Henry Knox became the first Secretary of War, serving until 1795.

Post Office Department. The Post Office Department was the first to be organized, after the first three originally established, but it was not raised to the dignity of a cabinet position until in 1829. The Postmaster-General is at its head. He is aided by four assistant postmastersgeneral, each having a specified line of duties.

Benjamin Franklin was made Postmaster-General by the second Continental Congress, serving as superintendent of the mails during the American struggle for independence. It is due largely to his studious efforts that the mail service was placed on an efficient basis in the early republic. As now organized, the first assistant postmastergeneral supervises the money-order system, the free-delivery system, the establishment of new post offices, and the dead-letter office, an office maintained to receive certain classes of un-claimed mail matters. The second assistant supervises the purchase of supplies, arranges the mail service, and directs matters relating to contracts. Postage stamps, wrappers, postal cards, and other supplies, and the general financial matters are under the direction of the third assistant. Appointments for fourth-class post offices are made by the fourth assistant, who in addition has charge of post office inspectors and issues commissions to postmasters. This department has charge of the entire mail service of the

nation, including that of the territories and the colonies. Samuel Osgood served as Postmaster-General from 1789 to 1791, but Timothy Pickering was the first to be appointed to that office after the department was regular-ly established, holding the position from 1791 until 1795. William T. Barry was the first Postmaster-General to have a place in the Cabinet. He held the position from 1829 to 1835.

DEPARTMENT OF THE NAVY. The Department of the Navy is under the management of the

Secretary of the Navy. It has charge of the vessels, guns, navy yards, and all other matters pertaining to the navy. Eight bureaus are maintained in the Navy Department. They are the bureaus of navigation, ordnance, yards and docks, medicine and surgery, provisions and clothing, steam engineering, and equipment and recruiting. The department is further assisted by the commandant of the marine corps and by the judge-advocate general. It prepares nautical charts with sailing directions and publishes the Nautical Almanac, a work of much value to seamen. George Cabot was the first Secretary of the Navy, holding the office in 1798.

DEPARTMENT OF THE INTERIOR. The Department of the Interior is directed by the Secretary of the Interior, who has charge of patents and copyrights, public documents, Indian affairs, pensions, mines and mining, and public lands. He

has supervision of the national census, which is taken every ten years, beginning in 1790. Other duties pertain to the public-land surveys, to railroads subsidized by the Federal government, to the management of affairs in the territories, and to the superintendence of certain charitable institutions of the District of Columbia. The commissioners of education, of Indian affairs, of pensions, of patents, and of public lands are subordinate officers of this department. Thomas Ewing served as the first Secretary of the Interior, holding the office from 1849 to 1850.

DEPARTMENT OF JUSTICE. The Department of Justice was created in 1789, but was not organized as a cabinet position until 1870. This cabinet office is under the direction of the Attorney-General, who is charged with the general superintendence of the attorneys and marshals of all the Federal courts in the states and territories. It is quite important that such a department be maintained, since through it general uniformity is secured in the trial and prosecution of cases. The Attorney-General examines the title of lands proposed to be purchased by the government for the erection of customhouses, forts, post offices, and other public institutions. Four assistant attorneys-general are employed. The Attorney-General rarely argues cases, this being done by subordinates, and he may employ counsel to aid district attorneys. Besides making an annual report to Congress, the Attorney-General is charged with the duty of giving opinions and rendering legal services to the heads of the departments and the President. Amos T. Ackerman held the office of Attorney-General from 1870 to 1871, being the first to hold the position as a cabinet officer.

DEPARTMENT OF AGRICULTURE. The Department of Agriculture was established in 1862, but the secretaryship was not made a cabinet position until 1889. It is presided over by the Secretary of Agriculture, whose duty is to obtain and disseminate useful information regarding agriculture to the classes interested in that industry, and to distribute among them seeds of new and useful plants. The department collects and publishes statistics in relation to agricultural products and domestic animals, investigates diseases among animals, observes the influence of climatic conditions upon plants and animals, and disseminates knowledge as to the diseases and insects affecting crops and live stock. Norman J. Coleman was Commissioner of Agriculture in 1889, when the office was made a cabinet position, but was succeeded in the same year by Jeremiah M. Rusk.

DEPARTMENTS OF COMMERCE AND LABOR. See Commerce and Labor, Departments of. UNITED STATES, Independence of the,

the freedom from dependence upon other nations that the Union has acquired. It dates from July 4, 1776, when the thirteen colonies adopted the following

DECLARATION OF INDEPENDENCE:

When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain inalienable rights. that among these are life, liberty and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed. That whenever any form of government becomes destructive of these ends, it is the right of the people to alter or abolish it, and to institute new government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and accordingly all experience hath shown, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security. -Such has been the patient sufferance of these colonies; and such is now the necessity which constrains them to alter their former systems of government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute tyranny over these states. To prove this, let facts be submitted to a candid world.

He has refused his assent to laws, the most wholesome and necessary for the public good.

He has forbidden his governors to pass laws of immediate and pressing importance, unless suspended in their operation till his assent should be obtained; and when so suspended, he has utterly neglected to attend to them.

He has refused to pass other laws for the accommodation of large districts of people, unless those people would relinquish the right of representation in the legislature, a right inestimable to them and formidable to tyrants only.

He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public records, for the sole purpose of fatiguing them into compliance with his measures.

He has dissolved representative houses re-

ED STATES

peatedly, for opposing with manly firmness his invasions on the rights of the people.

He has refused for a long time, after such dissolutions, to cause others to be elected; whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise; the state remaining in the mean time exposed to all the dangers of invasion from without, and convulsions within.

He has endeavored to prevent the population of these states; for that purpose obstructing the laws for naturalization of foreigners; refusing to pass others to encourage their migration hither, and raising the conditions of new appropriations of lands.

He has obstructed the administration of justice, by refusing his assent to laws for establish-

ing judiciary powers.

. He has made judges dependent on his will alone, for the tenure of their offices, and the amount and payment of their salaries.

He has erected a multitude of new offices, and sent hither swarms of officers to harass our people, and eat out their substance.

He has kept among us, in times of peace, standing armies without the consent of our legislature.

He has affected to render the military independent of, and superior to, the civil power.

He has combined with others to subject us to a jurisdiction foreign to our constitution, and unacknowledged by our laws; giving his assent to their acts of pretended legislation:

For quartering large bodies of armed troops

among us:

For protecting them, by a mock trial, from punishment for any murders which they should commit on the inhabitants of these states:

For cutting off our trade with all parts of the world:

For imposing taxes on us without our con-

For depriving us, in many cases, of the benefits of trial by jury:

For transporting us beyond seas to be tried for pretended offences:

For abolishing the free system of English laws in a neighboring province, establishing therein an arbitrary government, and enlarging its boundaries so as to render it at once an example and fit instrument for introducing the same absolute rule into these colonies:

For taking away our charters, abolishing our most valuable laws, and altering fundamentally the forms of our governments:

For suspending our own legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever.

He has abdicated government here, by declaring us out of his protection and waging war against us.

He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people.

He is at this time transporting large armies of foreign mercenaries to complete the works of death, desolation and tyranny, already begun with circumstances of cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the head of a civilized nation.

He has constrained our fellow citizens taken captive on the high seas to bear arms against their country, to become the executioners of their friends and brethren, or to fall themselves by their hands.

He has excited domestic insurrections amongst us, and has endeavored to bring on the inhabitants of our frontiers the merciless Indian savages, whose known rule of warfare is an undistinguished destruction of all ages, sexes, and conditions.

In every stage of these oppressions we have petitioned for redress in the most humble terms. Our repeated petitions have been answered only by repeated injury. A prince, whose character is thus marked by every act which may define a tyrant, is unfit to be the ruler of a free

people.

2994

Nor have we been wanting in attention to our British brethren. We have warned them from time to time of attempts by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them by the ties of our common kindred to disavow these usurpations, which would inevitably interrupt our connections and correspondence. They too have been deaf to the voice of justice and of consanguinity. We must, therefore, acquiesce in the necessity which denounces our separation, and hold them, as we hold the rest of mankind, enemies in war, in peace friends.

We, therefore, the representatives of the United States of America, in general congress assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions, do, in the name, and by authority of the good people of these colonies, solemnly publish and declare, That these united colonies are, and of right ought to be free and independent states; that they are absolved from all allegiance to the British crown, and that all political connection between them and the state of Great Britain, is and ought to be totally dissolved; and that as free and independent states, they have full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things which independent states may of right do. And for the support of this declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our lives, our fortunes, and our sacred honor.

JOHN HANCOCK.

CONNECTICUT.

Roger Sherman, Samuel Huntington, William Williams, Oliver Wolcott.

DELAWARE.

Caesar Rodney, Geo. Read, Tho. M'Kean. GEORGIA.

Button Gwinnett, Lyman Hall, Geo. Walton.

MARYLAND.

Samuel Chase, Wm. Paca, Thos. Stone, Charles Carroll, of Carrollton.

MASSACHUSETTS BAY. Samuel Adams, John Adams, Robt. Treat Paine, Elbridge Gerry.

NEW HAMPSHIRE.
Josiah Bartlett,
William Whipple,
Matthew Thornton.

NEW JERSEY. Richd. Stockton, Jno. Witherspoon, Francis Hopkinson, John Hart, Abraham Clark. NEW YORK. Wm. Floyd, Philip Livingston, Francis Lewis, Lewis Morris.

NORTH CAROLINA. William Hooper, Joseph Hewes, John Penn.

PENNSYLVANIA.

Robt. Morris, Benjamin Rush, Benjamin Franklin, John Morton, Geo. Clymer, Jas. Smith, Geo. Taylor, James Wilson, Geo. Ross.

RHODE ISLAND.
Stephen Hopkins,
William Ellery.
SOUTH CAROLINA.
Edward Rutledge,
Thos. Hayward, Jr.,
Thomas Lynch, Jr.,
Arthur Middleton.

VIRGINIA.

George Wythe, Richard Henry Lee, Thomas Jefferson, Benjamin Harrison, Thos. Nelson, Jr. Francis Lightfoot Lee, Carter Braxton.

UNITED STATES INDIAN TRAINING AND INDUSTRIAL SCHOOL, an institution at Carlisle, Pa., founded in 1879 by the government of the United States. This educational institution is designed to lead the Indian youth to more fully understand and better appreciate the trend of modern civilization, by offering training in the civil arts and in educational courses. While the boys and girls are pursuing study in the common school branches, they are trained in the manual trades and in domestic economy, and under a system of outing they are at opportune times placed as servants in the homes of white people. Both in school and while serving practically in the home, they practice the arts of the whites, thus developing the traits and customs of the Caucasian. Practically all the races of Indians found in Alaska and the United States have been represented in this institution, which has given training to more than 5,000 different students. The graduates, of which there are about 425. have engaged largely in the material industries and many have found employment under the government, either as teachers or in the public service. The attendance is about 1,400 students.

UNITED STATES MILITARY ACAD-EMY, the national institution of the United States for the education of officers for the army, located at West Point, N. Y. The necessity for a military academy for the technical training of officers became manifest in an early period of the Revolution. A plan for such a school was proposed by Gen. Henry Knox in 1776 and was elaborated by Alexander Hamilton. Its establishment was frequently recommended by Washington. The last letter written by him declares this to be "an object of primary importance to this country."

The United States Military Academy was organized under an act of Congress in 1802. Its first superintendent was Col. Jonathan Williams, a grand-nephew of Benjamin Franklin. Col. Sylvanus Thayer, whose statue at West Point bears the legend "The Father of the Military Academy," was superintendent from 1817 to 1833. The curriculum, military and academic, was adopted under his leadership. The traditions of Thayer were carried on and improved, under the supervision of Gen. James G. Totten, inspector of the institution from 1838 to 1864, by a succession of able superintendents. For 47 years one policy prevailed and the type of West Point education was fixed. The experience in the wars of 1846, 1861, and 1898 introduced modifications of details, leaving the early traditions substantially unchanged.

The first object of the institution is to form character. Habits of faithfulness, obedience, and attention to first duty, last and all the time. are inculcated throughout the entire course of four years. At the end of this period the cadet receives a commission as lieutenant in the army. The discipline is strict. A system of daily "marks" enables each cadet to judge his own conduct and to bring himself up to the re-quired standard. By this method habit becomes a second nature. The officer carries into the service qualities that have been inculcated continuously. All delinquencies are noted and punished, and the habit of punctuality is thus established. This is true likewise with other habits. The large number of instructors, all of whom are officers of the army, enables the proficiency of all cadets in every subject to be tested daily. Competence as well as satisfactory conduct is insisted upon in the daily routine. A high standard of personal honor and truthfulness is maintained. The record of the disbursing officers of the army for scrupulous honesty has never been equalled by any other organization.

The curriculum comprises courses in mathematics, English, French, Spanish, physics, chemistry, minerology, geology, electricity, history, military, constitutional and international law, civil and military engineering, tactics, topography, building construction, ordnance and gunnery, fortifications, the art of war, and military history. The corps of cadets comprises 522 persons, who are appointed by the President of the United States. One cadet is appointed from each congressional district (on the recommendation of its Representative), one from each Territory, one from the District of Columbia, one from Porto Rico, two from each state at large (on the recommendation of its senators), and forty from the United States at large. total number of graduates is about 4,850.

It is worthy of note that the graduates are successful in civil as well as in military pursuits. They have given to the country 1 President, 4 cabinet officers, 1 ambassador, 14 ministers to foreign courts, 26 United States senators or representatives, 16 governors of states or territories, 46 presidents of colleges, 130 professors and teachers, 87 presidents of railroad or other corporations, 63 chief engineers, 228 civil engineers, 179 authors, etc., etc. In 1902 President Roosevelt said "No other educational institution in the land has contributed so many names as West Point to the honor roll

of the nation's greatest citizens."

UNIVERSALISTS (ū-nǐ-vēr'sal-ĭsts), a religious sect which holds to the doctrine that all men will be saved, that even the fallen angels will be forgiven and enjoy eternal life. Those who support this faith hold to the view that salvation is universal and that the Scriptures declare it to be the purpose of God to reveal His grace as extensively as sin is or can be, hence all souls are to be reconciled to God that He may be all in all. The doctrine stands in direct opposition to the dogma of eternal punishment. Universalism, as a specific faith, was founded about 1750, but many members of other sects hold the view that universal bliss is in store for mankind. That man is not a fallen creature, sunk in total depravity, but a being created in the spiritual image of God, is the central element of Universalism. It teaches that salvation is a redemption from sin itself, but not a redemption from the consequences of sin. The chief duty of man is held to be the creating and upbuilding of character, in which he is assisted by a contemplation of the ideals of life as represented by Jesus Christ. In 1916, Canada had about 2,000 Universalists. In the United States they have 765 ministers, 798 churches, and a membership of 60,675. Their church property is valued at \$10,800,000. They maintain a Young People's Christian Union, which has 480 societies. The Christian Leader, Boston, and The Universalist, Chicago, are the leading periodicals.

UNIVERSAL LANGUAGE. See Esperanto; Volapük.

UNIVERSE (ū'nĭ-vērs), the grand and total aggregate of created things, or all the created things viewed as constituting one system. Anciently the earth was supposed to be the center of the universe and it was thought that all the heavenly bodies revolve about it. The invention of the telescope and the discovery of the law of gravitation revolutionized this theory to the extent that the sun was made the center of the universe, but it was supposed that all the planets and the countless stars move about it as a common center. Ultimately it became known that space includes many solar systems and that the sun is but the center of one system within the universe. Modern astronomy makes the universe one grand whole, so widely extensive, entirely endless in space, that the mind is incapable of conceiving any limits or fixing boundaries beyond which its influence does not extend. In this sense the universe includes not only the planets and all the satellites known to us, but embraces every particle of creation. It comprises not only our solar system, but includes the numerous other similar systems of which many of the fixed stars seem to be the

centers. See Solar System.

UNIVERSITY (ū-nǐ-vēr'sĭ-tỹ), an institution of higher learning. It affords facilities for superior instruction, or for the examination of students who have already been instructed in certain higher courses, and has power to confer degrees to those making a creditable record in the branches of study pursued. The term originated from the word universitas, meaning the whole of anything, and was first used to designate a collection of teachers and learners. Hence, the word university originally had a very various application, indicating a society or body of musicians, priests, teachers, or players. The modern universities had their rise in Europe in the Middle Ages and were at first essentially ecclesiastical. Gradually their func-tions became specialized, thus giving rise to several faculties, each of which became devoted to some important branch of instruction, as is now the case in Germany. In other instances colleges or subordinate teaching bodies were formed, as in the large universities of England. where the relation of the university to the college is similar to that of a federal government to the several states composing a federation.

The name university has been applied loosely to many institutions in the United States, though this country has the largest number of educational establishments bearing that name. However, many of them have a standard lower than that of others which are institutes, or colleges, and some represent only a single faculty. At present there is a general tendency to restrict the word to institutions having affiliated professional schools and offering nonprofessional instruction beyond the bachelor's degree. A large number of the American universities are sectarian, though none of this class belongs to the Federal or State institutions. In the states a number of universities are maintained, some of which have a fully developed university course, while others answer more especially to the term normal school or college. The American universities and colleges include about 400 different They have 9,650 professors and institutions. teachers and about 175,500 students. The libraries of these institutions have 2,200,000 volumes. These estimates are taken from the latest reports available, but conditions are always such that the number of students varies greatly from year to year. The money invested in schools of technology, colleges, and universities in the United States is placed by statisticians at \$325,-550,000.

The students studying medicine, law, and theology in the American universities are placed at 48,500, while the number pursuing studies in

the liberal arts and technology is given at 115,250. Most of the institutions of higher learning in America are coeducational, though some are open only to men and others only to women. Apparently there is a constant increase in the number of students who make it an objective point to study politics, science, sociology, jurisprudence, and similar topics. Among the most important institutions of the United States classed as universities are the Armour Institute of Technology, Chicago, Ill., founded in 1893; Boston University, Boston, Mass., 1872; University of California, Berkeley, Cal., 1868; Central High School, Philadelphia, Pa., 1837; University of Chicago, Chicago, Ill., 1889; College of the City of New York, New York City, 1847; Columbia University, New York City, 1754; Cornell University, Ithaca, N. Y., 1818; Columbian University, Washington, D. C., 1821; Girard College, Philadelphia, Pa., 1848; Harvard University, Cambridge, Mass., 1636; University of Illinois, Champaign, Ill., 1867; Indiana University, Bloomington, Ind., 1820; University of Iowa, Iowa City, Iowa, 1856; University of Kansas, Lawrence, Kan., 1866; Lake Forest University, Lake Forest, Ill., 1876; Leland Stanford Junior University, Palo Alto, Cal., 1891; Massachusetts Institute of Technology, Boston, Mass., 1865; University of Michigan, Ann Arbor, Mich., 1837; University of Minnesota, Minneapolis, Minn., 1868; University of Nebraska, Lincoln, Neb., 1871; New York University, New York City, 1831; Northwestern University, Evanston, Ill., 1855; Ohio State University, Columbus, Ohio, 1870; Pratt Institute, New York City, 1887; Princeton University, Princeton, N. J., 1746; University of Nashville, Nashville, Tenn., 1785; Washington University, Saint Louis, Mo., 1853; University of Wisconsin, Madison, Wis., 1849, and Yale University, New Haven, Conn., 1701. Each of the foregoing institutions has an attendance of more than 1,000 students. Other institutions of importance include William and Mary College, Williamsburg, Va., 1693; Brown University, Providence, R. I., 1764; Dartmouth College, Hanover, N. H., 1769; Johns Hopkins University, Baltimore, Md., 1776; Rutgers College, New Brunswick, N. J., 1770; University of Georgia, Athens, Ga., 1801; Amherst College, Amherst, Mass., 1821; Washington and Lee University, Lexington, Va., 1749, and Vanderbilt University, Nashville, Tenn., 1875.

Germany is noted for its great universities, which at present rank as the most famous institutions of learning in the world. Fully twenty institutions in the German Empire may be classed as more than national, since they attract a large number of students from all parts of the world. The oldest European institutions of higher learning are those of Bologna and Paris, both dating as universities from the 13th century. England and Scotland each have four universities; Ireland, two; and Italy, twenty.

The universities of Russia are modeled after those of Germany, both in the courses of study and in the discipline, and many of the professors are German. They include those of Saint Petersburg, Moscow, Kiev, Helsingfors, Kazan, and Dorpat; the last named has a noted theological faculty. The most celebrated Greek university is at Athens. It was established in 1837, has four faculties, and is organized on the German plan. The principal Mohammedan university is at Cairo, Egypt. Celebrated universities are maintained in China, Japan, and India. A number of excellent institutions carrying university courses are maintained in Australia and South America, particularly in Peru, Colombia, Argentina, and Brazil. Below is a list of the larger institutions of the world, outside of the United States, arranged according to their attendance. The number of students given in this list is from various sources, representing the attendance in 1913-1914:

LOCATION.	STU- DENTS.	
Paris	France	16,512
Berlin	Germany	14,351
Madrid	Spain	6,142
Vienna	Austria	8,780
Naples	Italy	5,150
Moscow		9,660
Budapest		4,495
Munich		7,579
AthensOxford		3,500
Leipsic		3,500
Saint Petersburg		6,095
Cambridge		3,450 2,960
Prague		4,114
Kiev	Russia	2,750
Manchester	England	2,925
Edinburgh	Scotland	2,560
Turin	Italy	2,190
Lyons	France	2,145
Bordeaux	France	2,140
Helsingfors	Finland	2,000
Copenhagen Rome (Royal University)	Denmark	1,915
Rome (Royal University)	Italy	1,898
Tokio	Japan	1,890
Barcelona	Spain	1,880
Toulouse	France	1,825
Glasgow	Scotland	1,775
Gratz	Austria	1,765
Toronto	Canada	1,750
Bonn	Germany	3,021
Bucharest	Germany Rumania	1,740 1,685
Louvain	Belgium	1,670
Freiburg	Germany	1,645
Kharkov	Russia	1,590
Padua	Italy	1.575
Lemberg	Austria	1,575 1,575
Montpellier	France	1,515
Upsala	Sweden	1.510
Breslau	Sweden Germany	1,500
Montreal	Canada	1,500
Cracow	Austria	1,490
Würzburg	Germany	1,430
Liége	Belgium	1,420
Palermo	Italy	1,390
Göttingen Lille	Germany	1,375
Havana	France	1,350
Urbana	Italy	1,350
Brussels	Belgium	1,340
Strassburg	Germany	1.315 2,569
Manila	Philippines	1,260
Tübingen	Germany	1,260
Salamanca	Spain	1,250
Dublin	Ireland	1,230
Heidelberg	Germany	1.212
Christiania	Norway	1,212 1,200
Amsterdam	Holland	1,175
Erlangen	Germany	1.160
Pisa	Italy	1,150
Santiago	Chile	1,140
Bern	Switzerland	1,762

UNIVERSITY EDUCATION, Cooperative, the movement to promote a "noble community of learning" among the world's great universities. For some years there has been such affiliation as permits a student to work for the higher degrees in several different institutions. This enables him to get the best out of each university and, as a form of educational "reciprocity," is growing in favor. A new and powerful impetus was given to the idea of mutual work in university education by Cecil Rhodes, the "Colossus of South Africa, whose beguest of \$10,000,000 created in 1902 the Rhodes scholarships at Oxford, England. Under liberal conditions students from the United States, Germany, and the British colonies are appointed to these scholarships. This promises to result in strengthening the racial and intellectual bonds by which a world civilization is held together.

Among American universities there is now frequent interchange of professors. Members of the Harvard faculty, for example, lecture for a semester or a year at the University of California; men from Johns Hopkins do the same at the University of Chicago, and so with others. Similar exchanges of professorial service have taken place also between American and foreign institutions. But the most noteworthy step that has yet been taken in university cooperation was initiated by the German emperor, Wilhelm II., in 1904. The emperor, at his New Year's reception to the diplomatic corps in that year, suggested to Charlemagne Tower, the American ambassador, an official interchange of professors between German and American universities. The suggestion was worked out in detail at an informal conference between President Nicholas Murray Butler, of Columbia University, the German emperor, and the Prussian minister of education, Herr Althoff, at Wilhelmshöhe, in August, 1905. Its practical application was made possible on the American side by the munificence of James Speyer of New York City, who placed \$50,000 in the hands of the trustees of Columbia University for the endowment of a professorship in the University of Berlin.

This professorship, known as the Theodore Roosevelt Professorship, is tenable for one year at a time. The incumbents are nominated by the trustees of Columbia University and confirmed by the Prussian minister of education. They will lecture on American history and institutions, including American political economy, Their services may be extended to other German universities. The first lecturer appointed to this professorship was John William Burgess, dean of the faculty of political science at Columbia. He began his work in the winter of 1906-1907. The government of Germany endowed a similar professorship at Columbia University and Hermann Schumacher, professor of political economy in the University of Bonn, was nominated by the Prussian minister of education as the first incumbent. The appointment was confirmed by the authorities of Columbia University and Dr. Schumacher entered upon his duties also in the winter of 1906-1907. This arrangement marks an important epoch in education which has since borne good results in many institutions.

EXTENSION, a plan UNIVERSITY whereby the benefits of university work may be enjoyed by persons residing in different communities from those in which such an institution is located. The movement to carry means of higher education to persons of all classes and of both sexes by organizing local associations in suitable places dates from 1872, when the University of Cambridge, England, appointed a syndicate to organize lectures by university men. These lectures, which have sinse grown to marked popularity, are similar in character to those given at Cambridge. A like plan was established by Oxford University in 1885. The university extension movement was first introduced into the United States in 1887 by J. N. Larned, superintendent of the Buffalo library, but was recommended by persons connected with Johns Hopkins University in the same year. No widespread movement was inaugurated until the plan was taken up by the University of Pennsylvania, in 1890, and an organization was formed under the name of the American Society for the Extension of University Teaching. Since then the movement has spread into all parts of the country and has been taken up by all the larger colleges and universities. In some sections of the country the institutions of higher learning have formed cooperative associations, thus giving the movement the prestige of combined effort and the advantage of associating the talent of a number of eminent instructors and lectures.

The University of Chicago maintains a special department of this work. Those joining the classes in different communities are organized into university extension centers. These centers have regular meetings, usually twice each month, at which the topics outlined in a wellplanned course of study are discussed under the direction of a local leader, and lectures are given in addition by eminent educators or by the ablest professors of the institutions managing the university extension work. The course of study is usually issued in installments of twelve numbers, each covering a month's work, and the whole course outlines one subject, such as political science, literature, or history. Those completing the work and passing a satisfactory examination are granted certificates, the examination work being done under the direction of some one appointed by the association, and the papers are afterward sent to the institution having charge of the enterprise, where they are inspected and certificates are issued according to the work done. The movement as a whole has been of incalculable benefit, since it has carried superior thought and consecutive study to communities otherwise deprived of such advantages and given many persons the attendant benefits. The plan outlined in this article is in successful use by many institutions and the branches studied cover a wide range of knowledge.

UNIVERSITY OF CHICAGO. See Chi-

cago, University of.

UPAS (ū'pas), a tree of the nettle family, which yields an acrid, milky juice that contains a virulent poison, the upas antiar. It is native to Java and other islands of the East Indies and several species of it are indigenous to tropical Africa. The stem is naked for the first 50 to 80 feet and its height often exceeds 100 feet. The leaves are lanceolate and alternate and the fruit is a kind of drupe, covered with fleshy scales. It was long thought that mere contact with the tree would result in injury to animals and plants, but it is known that the poisonous properties are similar in effect to those of the poison ivy. Natives use the juice of the tree in poisoning their arrows. Several species have been described, some of which yield an inner bark that is valuable in making bags and clothing. In 1844 specimens were brought to Europe and several species are now grown in gardens and hothouses.

UPHAM (ŭp'am), Charles Wentworth, clergyman and author, born in Saint John, New Brunswick, May 4, 1802; died in Salem, Mass., June 15, 1875. His early life was spent on a farm, but he was afterward apprenticed to an apothecary. Subsequently he attended Harvard University, from which he graduated in 1821, and later pursued a course in theology. He became pastor in Salem in 1824, remaining at the First Church until 1844. After resigning on account of ill health, he became editor of the Christian Register, and subsequently traveled and lectured. In 1849 he was elected to the State Legislature and subsequently served in Congress. His best known works include "Prophecy as an Evidence of Christianity," "Memoir of Tim-othy Pickering," "Letters on Logos," "Life of John Charles Fremont," "History of the Salem Witchcraft Delusion of 1692," and three volumes of "Life of Timothy Pickering."

UPMARK (up'märk), Gustaf Heinrich Vilhelm, art-historian, born in Stockholm, Sweden, in 1844. He studied at the University of Upsala, where he graduated in 1869, and in the same year secured an appointment in the National Museum at Stockholm. His efficient work caused his appointment as director of that institution in 1880. He founded the Gripsholms Society, under whose direction the ancient castle of the Vasa dynasty was restored. He published a number of historical works and essays relating to art in Sweden. His chief work of interest is a publication entitled "Architecture of the Period of Renaissance in Sweden, 1530-1760."

UPSALA (ŭp-sä'lä), or Upsal, a city of Sweden, on the Fyris River, 42 miles northwest of Stockholm. It occupies a fine site in a fertile valley and may be reached by a number of railways. The University of Upsala is the chief educational institution in Sweden. It was founded in 1477, has a library of 300,000 volumes, and is attended by 1,510 students. This library contains a Bible in which Luther and Melanchthon wrote comments. The cathedral, founded in 1258, is a beautiful structure in the Gothic style. In it are the tombs of Linnaeus, Gustavus Adolphus, and several other prominent men of Sweden. Upsala has beautiful botanical and zoölogical gardens, numerous secondary schools and churches, the Museum of Northern Antiquities, and the Ultuna Agricultural Institute. It has fine public improvements, including pavements, sewerage, waterworks, gas and electric lighting, and ample facilities for rapid transit. About three miles north of the city is the town of Gamla Upsala, which occupies the site of the traditional capital and fortress built by Odin. Although it has some manufactures and a brisk trade, it is important mainly as an educational center. Population, 1912, 26,260.

UPSHUR (ŭp'shēr), Abel Parker, statesman, born in Northampton, Va., June 17, 1790; died Feb. 28, 1844. He studied law at Richmond, was admitted to the bar in 1810, and began a successful practice in that city. In 1824 he was elected to the State Legislature and two years later became judge of the general court in Virginia. He was made Secretary of the Navy by President Tyler, in 1841, and two years later succeeded Daniel Webster as Secretary of State. Owing to his proslavery policy, he favored the annexation of Texas. His death occurred by an explosion while on board the Princeton, a steamer of the United States navy.

UPTON (ŭp'tŭn), Emory, soldier, born at Batavia, N. Y., Aug. 27, 1839; died March 15, 1881. He studied at Oberlin and the United States Military Academy and joined the Federal army at the beginning of the Civil War. During the first year of the war he fought at Bull Run and was stationed at Fort Washington. Later he took part in the Peninsular and Maryland campaigns. He served in the Battle of Antietam, was in the Rapidan campaign, and commanded a brigade in the battles of the Wilderness, distinguishing himself particularly at Spottsylvania Court House. In 1864 he was transferred to the Shenandoah valley and later in the same year to the West, where he operated successfully until the close of the war. He was commandant of cadets at West Point from 1870 until 1875, and in the latter year was sent on duty to Asia and Europe. His death resulted from suicide, committed while in a state of insanity.

URAL (ū'ral), a river rising in the Ural Mountains and forming a part of the boundary between Asia and Europe. The general course

is toward the south. Although it has a length of 1,385 miles, it is shallow in the greater part of the course and is not valuable in commerce. It flows into the Caspian Sea by a considerable delta. Only a small portion is navigable, but it contains extensive fisheries. The lower course of the river is strongly fortified. Orenburg and Ouralsk are the chief cities on its banks. The affluents include the Or, Kizie, and Sakmara rivers.

URAL MOUNTAINS, a chain of mountains in Eurasia. They form the principal part of the boundary between Asia and Europe, stretching southward from the Kara Sea fully 1,875 miles. These mountains contain a number of parallel ridges, from which swells and spurs extend at nearly right angles, and attain heights of 4,500 to 5,515 feet. There is a gradual rise from the Kara Sea until the north central part is reached, where the chain attains its highest summits. The slopes are gradual in the greater part of these highlands. Extensive deposits of minerals abound, chiefly coal, iron, copper, platinum, gold, topaz, emerald, diamond and amethyst. The northern region has a very cold climate, but the southern part is favorable to the production of cereals and live stock and contains valleys of great fertility. Among the streams rising in the Ural Mountains are the Petchora, Kama, Tobal, and Ural rivers.

URANIA (û-rā'nī-a'), in Greek mythology, one of the nine Muses, a daughter of Zeus and Mnemosyne. She was the goddess of astronomy and was usually represented with a staff point-

ing at a celestial globe.

URANIUM (û-rā'nĭ-ŭm), a rare metallic element discovered by Klaproth in 1789, so named from the planet Uranus. It occurs chiefly in pitchblende, has a silvery luster, and melts at a bright red heat. Compounds of uranium are obtained from the uran-ocher found at Cornwall, England. Sodium uranate, known commercially as uranium yellow, is one of many salts obtained from it. This product is used in painting on glass and porcelain. Uranoso-uranic oxide, which is obtained from uranium, is used to some extent in producing a black glaze on porcelain. Becquerel, in 1896, demonstrated that certain radiations are emitted by uranium and by the salts of uranium.

URANUS (ũ'rà-nŭs), or Coelus, in Greek legends, the deity representing the light and air of heaven. He is sometimes mentioned as the son of Gaea, the earth, but chiefly as her husband. Classical writers represent him as the father of Oceanus, Saturn, the Cyclops, Themis, Mnemosyne, and Tethys. Since he had a feeling of natural aversion to his children, he confined them in Tartarus, but Gaea induced Cronos, the youngest of the Titans, to mutilate and dethrone him. It is recounted that Gigantes sprang from drops of his blood, and that Venus was evolved from the foam that surrounded

him while he swam in the sea.

URANUS, one of the superior planets, occupying a place between Saturn and Neptune. The ancients knew of this planet, but it was rediscovered by William Herschel in 1781, after the construction of his great reflecting telescope. His attention was attracted by a star in the constellation Gemini, which he observed as having a disk different from the others. He announced soon after that he had discovered a new comet, but a few months later the error was revealed and the body was admitted to be a member of the solar system. The diameter of Uranus is about 31,900 miles. Its density is about equal to that of ice, somewhat lighter than water. The mean distance of Uranus from the sun is placed at 1,781,900,000 miles and its year is about 84 of our years. Little is known of the seasons of Uranus, but the length of its day is placed at between nine and ten hours, and the light received from the sun is estimated at about the quantity which would be afforded by 300 full moons. Uranus has four satellites, which revolve round it from east to west and move in planes nearly perpendicular to the ecliptic, a circumstance not known in the case of any other planet. The satellites are Ariel, Umbriel, Titania, and Oberon. See Satellite.

URBAN (ūr'ban), the name of eight popes, who reigned as bishops of Rome in the period between 223 and 1644. Urban I. reigned from 223 to 230 and is thought to have suffered martyrdom. Urban III. was Pope from 1185 to 1187 and was succeeded by Gregory VIII. Urban IV. succeeded to the pontificate in 1261 and in 1265 was succeeded by Clement IV. Urban VII. was elected Pope on Sept. 15, 1590, but died before consecration, on Sept. 27, 1590. The other popes of the same name are treated

in the articles following. See Pope. URBAN II., Pope of Rome, born in Lagery. France, about 1042; died July 29, 1099. He was educated for the church and entered the cloister at Cluny, of which he became prior. Gregory VII, made him cardinal of Ostia in 1078. He was elected Pope at Tarracina in 1088, when Rome was in possession of the anti-pope, Clement III. The important events of his pontificate include the expulsion of his rival, Clement III., from the fortresses of Rome and his connection with the first Crusade, which united Christendom into a vast warlike confederacy under the Pope. His decision and energy caused the capture of Jerusalem by the Crusaders, but he died fourteen days after that event took place.

URBAN V., Pope of Rome, born in Grisac, France, in 1309; died in Avignon, Dec. 19, 1370. He was a Benedictine monk, and subsequently became doctor in canon law, teaching at Montpellier and Avignon, and for some time held the office of abbot of Saint Victor in Marseilles. Later he served as papal legate in Naples and Sicily. He was elected Pope on Oct. 28, 1362, as successor to Innocent VI. His

pontificate is noted for the masterful effort made to restore the papacy to Italy and he was the last of the popes to reside at Avignon, France. He transferred the papal seat to Rome in 1367, where he was greeted with joy by the clergy and people. His reputation is that of a man of piety and religious zeal. Writers speak of him as a protector of letters and a patron of learning. He was succeeded by

Gregory XI.

URBAN VI., Pope of Rome, born in Naples, Italy, in 1318; died Oct. 15, 1389. He was a devout and learned monk and in 1377 became archbishop of Bari. The people of Italy made a demand for the election of an Italian Pope, which was largely instrumental in him being chosen to succeed Gregory XI. in 1378. His zeal to carry out reforms brought him in contact with organized opposition among the cardinals, thus causing a schism in the church that was not overcome until about forty years later. Twelve French and three Italian cardinals formed a union against the newly elected Pope and, after repudiating their previous action, elected Robert of Geneva to the pontificate, who assumed the title of Clement VII. Urban continued to hold his seat at Rome, while Clement officiated at Avignon. The two popes excommunicated each other and continued to maintain authority over the two divisions of the church, each resorting to extreme measures in order to maintain his claim. Clement was put to flight by troops sent against him from Rome, but Charles, King of Naples, began to resist the papal pretensions and caused Urban to be besieged at Nocera, whence he afterward fled to Genoa. He died soon after from an injury

sustained by falling from his horse.

URBAN VIII., Pope of Rome, born in Florence, Italy, in 1568; died July 29, 1644. He descended from a wealthy Florentine family, who gave him the advantages of a liberal education. After holding several important charges in the church, he was elected as successor to Gregory XV. in 1623. His pontificate of 21 years includes the most important period of the Thirty Years' War, and it is due to him that the temporal power of the Papacy was retained in Italy. In 1633 Galileo was summoned to Rome to make his celebrated recantation, but, on the other hand, Urban patronized Claude Lorraine and others. Urban VIII. did much to improve the city of Rome, enlarged the Vatican library, and founded the College of the Propaganda. He is the author of a number of Latin verses and hymns and of several comments on the Scriptures. About seventy sonnets written by him were published in 1640. Inno-

cent X. succeeded him.

URBANA (ûr-băn'à), a city of Illinois, county seat of Champaign County, 75 miles northeast of Springfield, on the Wabash and the Cleveland, Cincinnati, Chicago and Saint Louis railroads. It is surrounded by an agri-

cultural and mineral region and has a number of extensive machine shops and manufacturing establishments. The principal buildings include the high school, the public library, the county courthouse, the Y. M. C. A. building, the Masonic Temple, and many fine churches. It has Crystal Lake Park. The University of Illinois, situated between Urbana and Champaign, is reached by an electric railway. It has public waterworks and sanitary sewerage. The place was settled in 1824 and incorporated in 1860. Near it is the University of Illinois, an institution of learning established in 1862. Population, 1900, 5,728; in 1910, 8,245.

URBANA, a city in Ohio, county seat of Champaign County, 94 miles northeast of Cincinnati, on the Pennsylvania, the Erie, and the Cleveland, Cincinnati, Chicago and Saint Louis railroads. It is surrounded by a fertile farming and dairying country. The notable buildings include the county courthouse, the public library, the high school, and the Urbana University. Among the manufactures are machinery, cigars, furniture, brooms, woolen goods, and carriages. Electric and gas lighting, public waterworks, and sanitary sewerage are among the municipal improvements. The place was platted in 1805 and was garrisoned in 1812.

Population, 1900, 6,808; in 1910, 7,739.

URBINO (oor-be'no), a town of Italy, in the Apennine region of Marches, about twenty miles from the Adriatic Sea. It is situated between the Foglia and Metauro rivers, near the valley of the latter. Its magnificent palace was formerly occupied by the dukes of Urbino, and surrounding it are walls dating from the 14th century. The Albini palace, built by an Albanian family, is also at Urbino. This family furnished one of the popes, Clement XI. Urbino has manufactures of pins, matches, earthenware, utensils, and pottery. The city dates from the time of the Romans and in the Middle Ages became the seat of independent dukes. It was made a part of United Italy in 1860. Population, 1916, 18,968.

URCHIN. See Sea Urchin.

URIM AND THUMMIM (ū'rim, thum'mim), a contrivance mentioned in connection with the breastplate of the Jewish high priest and employed as a sort of divine oracle. The exact nature of this contrivance is not known. but it is supposed to have consisted of four rows of precious stones bearing the names of the twelve tribes, and in connection with these were two small figures or images. The figures are thought to have personified light and perfection, but some writers think that they signified truth and revelation, and others that they personified doctrine and judgment. The Urim and Thummim is mentioned only in or before the time of Solomon, when it was put over the breast of the high priest as he entered into the presence of Jehovah. Joseph Smith used the names in connection with the reading of the

3002

plates alleged to have contained the Book of Mormon

URINE (ū'rĭn), in mammals, the fluid which is secreted from the blood by the kidneys. In birds and reptiles, the urine is a solid or semisolid excretion. The urine of man is a clear and transparent fluid with a normal density of 1.02. It is slightly acid, has a color which somewhat resembles amber, and chemically consists mainly of an aqueous solution of urea, salt, uric acid, and small quantities of hippuric acid. In a healthy individual it consists of 40 parts of solid matter to 960 parts of water. About two and a half pints are discharged daily by an adult, but the quantity varies somewhat, being diminished by excessive perspiration and increased by cold and by drinking large quantities of water. It is transmitted slowly but continuously by the ureters of the kidneys to the bladder, where it is retained until the distension of the organ requires its evacuation. The secretion is derived from arterial blood and is expelled by the agency of the abdominal muscles assisted by the contraction of the walls of the bladder. The urine is greatly affected by diseased conditions of the body. It may contain bile pigments, as in jaundice; sugar, as in diabetes; and albumin, as in Bright's disease. See Kidney.

URSA MAJOR AND URSA MINOR. See Bear, Great and Little.

URSO (ur-sô'), Camilla, violinist, born in Nantes, France, in 1841; died in 1902. studied music in Paris and came to the United States at the age of ten years. In 1853 she began to play successfully in New York City and subsequently toured Canada and the United States. Later she returned to France, but afterward took up her residence in New York. Her greatest successes were made in concerts with Alboni and Sontag. She was considered the most eminent female violinist in her time.

URSULA (ûr-sū'là), Saint, a Christian martyr highly honored in Germany, commemorated by the church on Oct. 21. Writers differ as to the time in which she lived and assign her martyrdom at Cologne to various dates in the 3d, 4th, and 5th centuries. She is reputed as the daughter of Deonatus, a Saxon king. Her great beauty caused a pagan prince, named Holofernes, but afterward called Aetherius, to seek her hand in marriage. Ursula consented with the condition that he become a Christian and that he allow her and her ten companions to make a pilgrimage to Rome. The proposed pilgrimage was to cover a period of three years and each of the maidens was to be accompanied by 1,000 maiden companions, making a total of 10,000. This vast company was collected from all parts of the world and embarked from the shores of Britain in three-oared galleys. They sailed up the Rhine to Cologne and thence to Basel, where they left their galleys to proceed overland to the region of Rome and the tombs of the apostles. The country had in the meantime fallen into the hands of Attila and the Huns, but this was not known to the maiden pilgrims, who returned unaware of their danger with their galleys to Cologne. The pious virgins were immediately seized by Huns, who put them to death. However, the cruel barbarians were visited by a host of angel warriors, who smote them without mercy as a punishment for the cruel martyrdom to which they had subjected the maidens. The site on which Saint Ursula is supposed to have suffered martyrdom is now occupied by the Church of Saint Ursula.

URSULINES (ûr'sû-linz), an order of nuns in the Roman Catholic Church, founded by Saint Angela Merici of Brescia (1470-1540) in 1537, so named from Saint Ursula. The institution was organized with the special object of nursing sick, educating young women, attending to the wants of the poor, and sanctifying the lives of its members. Pope Paul III. confirmed the foundation of the order in 1544. Pope Paul V. issued a bull in 1612, by which the congregation was made a religious order, with solemn vows and strict inclosure. Several distinct congregations have been formed since that time. The celebrated sister, Madeline Saint Beuve of France, belonged to the Ursulines. Convents of the Ursulines were organized in Canada as early as 1639, the first one being instituted at Quebec. They are very numerous in Austria and Germany. Ursuline convents are maintained in Saint Louis, New Orleans, New York City, Louisville, San Antonio, Cleveland, Savannah, Columbia, and a number of other cities of the United States.

URUGUAY (oo-roo-gwi'), a river of South America, having its source in the province of Saint Catharina, in southern Brazil. The upper course is toward the west, but it makes a bold curve near the boundary of Argentina, whence it flows in a southern direction and joins the La Plata opposite Buenos Ayres. The Uruguay is important for its navigation facilities and fisheries and its basin is rich in fertile soil and an abundance of timber. Its entire length is 925 miles. The Rio Negro and Arapey are its chief tributaries. Salto, Concepcion, and Porto Ruiz are the chief towns on its banks.

URUGUAY, a republic of South America, the smallest country of that continent. It is bounded on the north by Brazil, east by Brazil and the Atlantic, south by the Atlantic and the estuary of the Rio de la Plata, and west by Argentina, from which it is separated by the Uruguay River. The area, including a few small islands, is 72,151 square miles.

DESCRIPTION. Much of the surface is fertile coast and valley land, characterized in localities by tablelands of moderate elevation. The northeastern part is hilly and from it elevated ridges extend toward the southwest, where the country resembles the pampas of Argentina. The highest elevations in the northwest do not exceed 2,000 feet. Sandy and marshy tracts of low land border on the ocean. Forests of considerable extent occur in most parts of the country, including the cedar, acacia, palm, aloe, myrtle, poplar, walnut, rosewood and eucalyptus.

The larger part of the drainage is by the Rio de la Plata, the Uruguay, and the Rio Negro. The Rio Negro rises in the southern part of Brazil and, after a course of 250 miles toward the southwest, flows into Uruguay. The Rio Arapey flows into the Uruguay. Lake Mirim, on the border of Brazil, receives the inflow of the Rio Cebollali. This lake affords considerable facilities for navigation.

Uruguay has a mild and healthful climate and an abundance of rainfall. The thermometer seldom falls below 33° and along the shores rarely rises above 85°, while the summer heat in the interior seldom passes above 100°. Cold storms blow from the southwest during the winter, when the highland regions are visited

by occasional snows.

RESOURCES. The minerals are abundant in the hilly district of the northeast, but mining is not important as an industry. Gold, silver, iron, zinc, lead, sulphur, coal, antimony, and tin exist in paying quantities. Granite and limestone of good quality are found in the hilly part of the north. The fisheries of the coast yield many species of marketable fish, but those of the interior, though valuable, have not been developed to a considerable extent.

The interior highlands are well grassed, but here the hot summers cause the grasses to dry early in some sections. Wild animal life is still abundant, including the tiger or ounce, puma, deer, wild dog, tapir, fox, water hog, and wild cat. Birds of song and plumage are numerous and the marshy lagoons are frequented by large numbers of water fowl. Among the reptiles are several species of lizards, rattlesnakes, tortoises, and turtles. More than 2,000 species of insects abound, including venomous

spiders and scorpions.

INDUSTRIES. Farming is the principal industry and corn and wheat are the chief cereals, both of which are exported. About half the cultivated area is utilized in growing wheat. Corn of a good quality is grown. Other crops include oats, barley, linseed, rye, and hay. Olives, grapes, lemons, oranges, peaches, apples, cherries, pomegranates, and figs are grown in abundance. Stock raising is carried on extensively, but the largest interests are vested in raising sheep and cattle. Other live stock includes horses, mules, swine, goats, and poultry.

Manufacturing is not an extensive enterprise, but considerable development has been made in the output of clothing, utensils, and machinery. Other manufactures include flour and grist, leather, cured and salted meats, canned fish and fruits, cheese and canned milk, and lumber and lumber products. The exports include meats, cattle, wool, fruits, and cereals, while the imports consist principally of textiles, hardware, and machinery. Commerce is largely with Brazil, Argentina, Germany, France, Great Britain, Spain, and the United States.

Transportation. Uruguay has 685 miles of maritime and river navigation. Large steamers ply on the Rio de la Plata and the Uruguay, and small craft navigates the Rio Negro. Lake Mirim is important as an outlet on the border of Brazil. The railroad lines in operation include 1,415 miles and about 5,500 miles of highways are in an improved state. Communication by telegraph and telephone lines is general throughout the populated sections of the country. The post office system is well managed. The peso is the monetary unit and is equal to \$1.034.

GOVERNMENT. The government is based on a constitution that dates from 1830. It vests the executive authority in the president, who is selected by male suffrage for a term of four years. He is assisted by a cabinet of five members, including those of the interior, finance, instruction and public work, war and marine, and foreign affairs. Legislative power is vested in the congress, which consists of a senate and a chamber of deputies. Each province or department is represented in the congress by one senator, who is chosen for a term of six years by an electoral college, the members of which are elected by popular vote. The chamber of deputies is composed of 69 representatives, elected for three years by popular suffrage. Uruguay is divided into nineteen departments or provinces for the purpose of local government. Each of these is ruled by an executive appointed by the president, but local legislation is vested in an administrative council for each department, whose membership is selected by popular vote. The smallest province has an area of 256 square miles, while the largest contains 8,074 square miles.

EDUCATION. The government contributes annually to the maintenance of a system of elementary and secondary schools, at which attendance is free and compulsory. These schools are maintained in part by local taxation. Montevideo is the seat of the University of Uruguay, which has an attendance of 450 students. Two normal training schools are maintained for the instruction of teachers. Other educational institutions include parochial schools, seminaries, a military institute, and an industrial school. Spanish is the official language. Roman Catholic is the state religion, but all other faiths are tolerated.

INHABITANTS. About seventy per cent. of the inhabitants are native born. This element is composed chiefly of people of Spanish descent, but includes a considerable element of Indian blood. European immigration is chiefly from Spain, France, Italy, and Germany. A large element of Brazilians is found in the northern part, and the western section contains many people who entered the country from Argentina. Montevideo, on the estuary of the Rio de la Plata, is the capital and largest city. Other cities include Salto, Mercedes, and Paysandu. Population, 1916, 1,343,040.

HISTORY. Uruguay was first visited by Juan Diaz de Solis, a Spanish explorer, in 1512, who found there a class of natives called Charuras. In 1516 he made a second visit to the region, but was slain by the natives in Colonia. Sebastian Cabot visited the region in 1527, but was defeated by the natives and compelled to retreat. The country was finally conquered by Jesuits in the time of Philip III. In the meantime numerous commercial settlements were formed by the Portuguese, but the Spanish established themselves at Montevideo in 1729. The region was long a part of Argentina, but in 1750 organized as an independent provincial government. A long struggle between the revolutionary government of Buenos Ayres and Brazil for supremacy in Uruguay finally made possible the establishment of the present republic in 1830. It was subsequently invaded at various times until 1870, but since then its development has kept pace with that of other South American states. Feliciano Viera was elected president in 1915.

URUMIAH (oo-roo-mē'a), or Urmia, a city in Persia, ten miles west of Lake Urumiah and about fifty miles southwest of Tabriz. It occupies a fine site in a fertile valley about 4,500 feet above sea level and is defended by a wall of brick and mud. The surrounding country produces large quantities of grapes, vegetables. and flowers. It is visited regularly by caravans and has a brisk trade. The city is beautified by fine gardens, though it includes only a few buildings of importance. A Nestorian bishop has his palace in the city, and it is the seat of a number of foreign missionaries and mission schools. It has manufactures of carpets, clothing, earthenware, and furniture. Urumiah is the reputed birthplace of Zoroaster. Population, 48,500.

URUMIAH, a large lake of northern Persia, about 160 miles west of the Caspian Sea. It is 82 miles long and 26 miles wide. The area is 1,960 square miles. It has no outlet to the sea, hence its waters are exceedingly salty. The Jage-tu River, 138 miles long; the Ta-tu, 88 miles long; and the Aji-su, 175 miles long, flow into it, but the average depth does not exceed twenty feet. Fish and mollusks do not live in its waters, being too strongly impregnated with saline matter to sustain animal life. Extensive deposits of salt occur in the vicinity of the lake, which is itself gradually decreasing in depth and leaving a belt of saline deposits on its shores. Maragha, a town of 25,000 inhabitants, is situated 22 miles southeast of the lake.

USBEKS (ŭs'běks). See Uzbeks.

USEDOM (50'zĕ-dôm), an island in the Baltic Sea. It is situated near the mouth of the Oder and belongs to Germany. The island is 35 miles long and 15 miles wide. It has an area of 150 square miles. The shape is very irregular, being indented by numerous bays and otherwise diversified by peninsulas and capes. For government purposes the island is a part of Pomerania. It is traversed by a railroad, which enters the island from the mainland, crossing the strait by an extensive iron bridge. The town of Usedom is on the southern shore and the port of Swinemunde is on the northern coast. Population, 1918, 34,628.

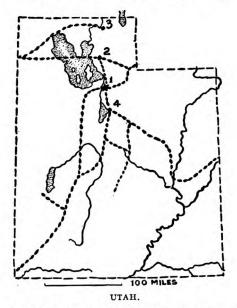
USURY (ū'zhū-ry), a term originally applied to the practice of lending money at interest, but now restricted to the charge of excessive rates of interest and to rates higher than those allowed by law. Legislation on the subject of usury dates from ancient times, but the practice attracted the most scrutinizing attention in the Middle Ages. In Athens, Solon canceled all the debts made on the security of the person or land of the debtor and established a law that subsequent loans could not be made on the bodily security of the borrower, but instead provided that the creditor should be limited to property security. Aristotle was persistent in the opinion that no profit should accrue to the lender of money, a view approved quite generally by the church throughout the Middle Ages. This position, taken by the fathers of the church and the Christian lawmakers, was the means of giving the Jews material advantages in the enterprise of dealing in money. They loaned all their available funds at lucrative rates, and in many cases excited such opposition by their thrift resulting from money lending that they were expelled from many countries, as was the case in England in 1290. At present all nations recognize money lending as an honorable enterprise, but protect the borrowing class by limiting interest charges to reasonable rates. In most instances the legal rate is from five to six per cent., though rates ranging from seven to ten per cent. may be charged in case the contract so specifies. Contracts providing a rate of interest greater than that allowed by statutory law are not collectible in the courts.

UTAH (ū'tä), a western State of the United States, popularly called the Salt Lake State. It is bounded on the north by Idaho and Wyoming, east by Wyoming and Colorado, south by Arizona, and west by Nevada. The length from north to south is 350 miles, the breadth is 280 miles, and the general shape is rectangular. All the boundaries are formed by lines of latitude and longitude. The area is 84,970 square miles, of which 2,780 square miles are water surface.

DESCRIPTION. The surface is diversified by high mountains, plateaus, and valleys, much of it being fertile, though arid. Utah occupies a favorable position in the great basin and

through its center, from north to south, trend the chains of the Wasatch Mountains. These extend into groups and connected chains in various directions. Among the most important ranges are the Snow, Beaver, Thomas, Wah-Wah, Stansbury, Fremont, Wasatch, Raft River, and Uinta mountains. The principal peaks include Mount Hilgard, 11,460 feet; Mount Terrill, 11,600 feet; Wheeler Peak, 12,075 feet; Gilbert Peak, 13,690 feet; and Mount Peale, 12,930 feet.

The drainage is wholly into the interior lakes, which have no outlet to the sea, and into the Gulf of California by tributaries of the Colorado River. Chief among the rivers that be-



1, Salt Lake City; 2, Ogden; 3, Logan; 4, Provo City. Dotted lines indicate the principal railroads.

long to the Colorado basin are the San Juan, Grand, Green, Virgin, and Uinta. Great Salt and Sevier lakes are remarkable for the extraordinary saltiness of their waters. The lakes are apparently the remnants of a vast inland body of fresh water that formerly covered the western part of the State. Great Salt Lake is the largest of the lakes. Into it flow the Bear River from Bear Lake and the Jordan River from Utah Lake. Sevier Lake, in the west central part, receives the drainage from the Sevier River. The Linear Plateau, in the southern part of the State, presents a variation from the more mountainous north and in this vicinity the Grand Cañon of the Colorado has its beginning.

The climate is pleasant and healthful, but the rainfall is insufficient to germinate and mature all the crops without irrigation. There is a wide range of difference in the temperature, from the pleasant valleys to the towering moun-

tain peaks, and the exposed localities have sudden changes and great extremes in summer and winter. Salt Lake City has a mean temperature of 28° in January and 76° in July. The extremes range from 30° below zero to 112° above, but these figures are for the more elevated and exposed localities. Many of the mountains are capped with snow the entire year, hence form an important agency in preserving the moisture that is needed for irrigation. As a rule the snowfall is light. The entire precipitation ranges from six inches in the southwest to seventeen inches in the vicinity of Salt Lake City.

MINING. The mineral wealth is important. Silver is the most abundant mineral and the annual output has a value of \$8,500,000. Gold takes rank next to silver and the annual yield is placed at \$5,250,000. In the production of copper Utah usually takes fifth rank. It likewise holds a high place in the production of salt. The State ranks third in the output of lead. Sulphur deposits of great value are worked in Millard and Washington counties and extensive fields of coal abound in Emery and Summit counties. Natural gas is found in large quantities in several parts of the State, especially in the vicinity of Salt Lake City, to which it is piped for use in the industries. Other minerals include granite, sandstone, limestone, gypsum, onyx, clays, and quicksilver.

AGRICULTURE. Farming is the chief occupation. The farms are owned largely by their occupants and average 212 acres. Irrigation is employed extensively with good results. In the cultivation of sugar beets Utah has fourth rank. Wheat is the leading cereal and is cultivated on a larger area than all the other cereals combined. Oats, corn, barley, and rye are grown successfully. Hay and forage crops exceed in acreage all others. Other crops include buckwheat, potatoes, flax, hemp, tobacco, and small vegetables. Many varieties of fruit are grown, such as grapes, apples, cherries, peaches, and apricots. Figs, lemons, and oranges yield well in the southern part.

The State has a vast area that produces nutritious grasses, hence has large interests in the live-stock industry. A material increase is shown within the past decade in the number of sheep, which are usually well graded, and in the quantity of the wool clip the State generally takes eighth rank. Large interests are vested in the cattle industry, both as an enterprise for obtaining meat and dairy products. Many large ranches are devoted exclusively to rearing horses, but as a rule the ranching is diversified in that a variety of animals are reared on the same ranch. Swine are grown profitably in sections where the climate is suitable for the cultivation of corn. Other domestic animals include mules, goats, and poultry.

MANUFACTURES. The materials for manufacturing purposes are varied and extensive.

The mountains and plateaus contain forests of cedar and pine, while the lower altitudes are skirted by groves of aspen, box elder, willow, and cottonwood. The lakes yield catches for canning and carp culture has greatly extended the fisheries. Beet sugar is manufactured on a large scale from native-grown beets, which produce profitably in the valleys, and much is done in canning and preserving fruits and veg-However, the larger manufacturing enterprises are connected with the mining industry and consist largely of the smelting and refining of ores. Other products include flour and grist, dairy products, confectionery, salt, packed meat, hardware, machinery, boots and shoes, clothing, and dried fruits.

Transportation. Great Salt Lake is important for navigation, but none of the rivers is utilized for that purpose. The railroad lines include 2,395 miles. Among the principal lines are the Union Pacific, the Rio Grande Western, the Central Pacific, the Oregon Short Line, and the San Pedro, Los Angeles and Salt Lake. All the settled portions have more or less conveniences in the use of telephones, telegraphs, and other modern facilities. Salt Lake City is the principal railroad and commercial center and has a large jobbing and wholesale trade with points in the Rocky Mountain states. Minerals, wool, live stock, packed meat, and fruits are

the leading exports.

GOVERNMENT. The constitution of Utah was adopted in 1895. It vests the executive authority in the governor, secretary of State, auditor, treasurer, attorney-general, and superintendent of public instruction, each elected for four years. Legislative authority is vested in the General Assembly, which consists of a senate and a house of representatives. The constitutional limit provides that the number of senators cannot exceed thirty, while the representatives cannot be less than twice nor more than three times the number of senators. The senators are elected for four and the representatives for two years, each in districts established by the Legislature. A supreme court of three or five judges has the highest judicial power. The judges of this court are elected for six years. District courts are maintained in judicial districts and the judges of such courts are elected for four years. Local government is administered by counties, municipalities, and townships.

EDUCATION. Originally the educational work was conducted largely through church organizations, but the present public school system was established in 1890. The rate of illiteracy is 3.1 per cent., based on the population ten years of age and over. The public schools are supervised under a State superintendent of public instruction, who is elected for four years and is aided by a board of education. In 1905 the Legislature enacted a law which permits the school districts to consolidate and maintain ele-

mentary and graded schools. This legislation has tended to promote a closer gradation of the educational work in the rural communities. All the larger towns and cities have high schools, which are under the direct supervision of principals or superintendents. The higher education culminates in the University of Utah, which was founded at Salt Lake City in 1850. Normal instruction is given at the State University and at a branch normal school at Cedar City. Among the institutions of higher learning are the Agricultural College of Utah, at Logan; the Salt Lake Collegiate Institute, Salt Lake City; the Brigham Young College, Logan; the All Hallow's College, Salt Lake City; the Latter Day Saints' College, Salt Lake City; and the Brigham Young Academy, Provo City. About three-fourths of the inhabitants are allied with the Morman Church, although all the leading Christian denominations are represented by organizations.

Ample provisions have been made for the unfortunate and incorrigible. Ogden is the seat of the State industrial school, Provo City has an insane asylum, and Salt Lake City has the State prison. An institution for the deaf, dumb,

and blind is located at Ogden.

INHABITANTS. The inhabited portions are confined chiefly to the irrigated and mining districts, though ranches are maintained where grazing can be utilized profitably. About one-fifth of the inhabitants are of foreign birth. This element includes largely English, Swedes, Germans, and Danes. Salt Lake City, on the Jordan River, is the capital. Other cities include Ogden, Provo City, and Logan. In 1900 the State had a population of 276,749. This included a total colored population of 4,284, of which 217 were Japanese, 552 Chinese, 672 Negroes, and 2,623 Indians. Population, 1910, 373,351.

HISTORY. The region included in Utah was acquired by the Mexican cession in 1848. It was inhabited by the Ute or Utah Indians, hence its name. The early development of the State was due to the Mormons, who settled here under the leadership of Brigham Young in 1847. At that time the region was regarded a desert waste, but under the industry of the Mormons irrigation facilities were provided to redeem large areas of the land and, with the building of railroads and the development of mines, permanent prosperity was assured. A constitution was adopted and the region was named the State of Deseret, in 1849, but Congress refused to admit it as a State. The territorial government was established in 1850, when it included a part of Wyoming, Colorado, and Nevada, but it was reduced to its present area in 1868. Polygamy was practiced for some time by a number of the Mormons, but the Edmunds bill of 1882 largely discontinued it, and subsequently plural marriages were renounced by the Mormon Church. In 1896 it was admitted as

a State, since which time the growth of its institutions and industries has been continuous.

UTAH, University of, an educational institution at Salt Lake City, Utah, maintained for both sexes by the State. It was founded as the University of Deseret in 1850, but was closed for want of funds until 1867, when it was reopened. The present name was assumed under a new charter in 1894, when the government made a grant of 60 acres and the State appropriated \$300,000 to extend and enlarge its facilities. It maintains courses in the arts and sciences, mining, normal instruction, and preparatory branches. Admission is without examination, provided the students present a certificate from accredited schools. The faculty includes 130 instructors and professors and the attendance is 2,500 students. The university library has 45,000 volumes and the property is valued at \$1,500,000.

UTAH LAKE, the largest fresh-water lake of Utah, in Utah County, 30 miles south of Salt Lake City. It extends 25 miles from north to south, is 13 miles wide, and has an area of 152 square miles. Its altitude above sea level is 4,500 feet. The lake is situated in a productive region of the State and is surrounded by railway lines. Provo City and several other towns are on its shore. The lake has an abundance of fine fish. Its outlet is into Great Salt Lake by the Jordan River.

UTAHS, or Utes, a tribe of Indians of the Shoshone family, formerly found in the region now occupied by Utah, Colorado, and a part of New Mexico. They subsist largely by hunting and fishing, though some engage in agricultural and pastoral pursuits. The Utahs are known as a brave and warlike class of Indians, but those on the Utah reservation are making considerable progress in industrial and educational arts. The tribe numbers about 15,000, though only about 5,000 are confined to the reservations in Utah, the others being in New Mexico, Colorado, and adjoining states.

UTICA (ū'tĭ-kā), a city in New York, county seat of Oneida County, on the Mohawk River, 95 miles west by north of Albany. Communication is furnished by the West Shore, the New York, Ontario and Western, the New York Central, the Delaware, Lackawanna and Western, and other railroads. Several electric railways furnish transportation to many parts of the State. Utica has a fine site, which rises gradually from the river, and the streets are well graded and paved. The surrounding region is a productive farming and dairying country. It has a large trade in cereals, fruit, merchandise, roses, cheese, hops, and live stock.

The city is well built of stone and brick. Among the noteworthy buildings are the county courthouse, the city hall, the Federal building, the public library, the Y. M. C. A. building, the Balliol School, the Faxton Hall Library, the German Library, and the State insane asylum.

It has the Utica Orphan Asylum, the Masonic Home, the Home for the Homeless, and many fine churches and hospitals. Utica has taken high rank as an industrial center since the completion of the Erie Canal. Among the principal manufactures are cotton and woolen goods, butter and cheese, ironware, spirituous liquors, machinery, boilers, earthenware, knit goods, and clothing. In 1772 the first settlement was made at Fort Schuyler and six years later the name was changed to Utica. It was incorporated as a city in 1832. Population, 1910, 74,419.

UTICA, anciently a city of Africa, situated about twenty miles northwest of Carthage, near the present city of Tunis. It is thought that the Phoenicians founded it about 1101 B. c. and it rose rapidly into commercial importance. Carthage was founded nearly 300 years later and the two cities long defended themselves under an alliance against the Roman invasions. It submitted to Rome in the Third Punic War, but Carthage continued its opposition and was destroyed, thus giving the former important trade advantages after the Roman conquest. It became the capital of the province and remained the emporium of Roman trade until Caesar rebuilt Carthage in 44 B. c. On its site are ruins dating from Roman occupation, including walls of an amphitheater that had a seating capacity for 20,000, baths and cisterns, and an artificial lake used by the Romans for practice in the arts of naval warfare. With the decline of Rome, it fell into the hands of the Vandals, in 439 A. D., and was afterward taken by the Byzantine leaders. It was finally captured and destroyed by the Arabs in the 8th century. Utica is mentioned is history as the city where Cato suicided.

UTILITARIANISM (ti-til-i-tā'ri-an-iz'm), the system of philosophy which teaches that all moral conduct is to subserve utility. According to this view the standard of right and wrong is based upon the theory that the happiness of mankind is the ultimate end of both ethics and philosophy. It stands in contradistinction to the theories that the test of right and wrong is to be referred to some internal sense or sentiment, which is described as conscience. moral sense, or innate moral distinctions. Some writers speak of utilitarianism as the external or the objective standard of morality, since it makes utility, not internal feeling, the standard of action. As a doctrine it may be traced back to the Greek moralists, who identified the supreme good with happiness. However, it was not emphasized in England until stated by John Locke. Later it was more clearly defined by John Stuart Mill and accepted in the philosophies of John Spencer and Sir Leslie Stephen.

UTOPIA (ti-tō'pĭ-à), the title of a romance published by Sir Thomas More in 1516, in which he describes an imaginary island called Utopia. He represents that the island was discovered by a companion of Amerigo Vespucci.

Upon this island everything was found perfect: the laws, the morals, and the politics. Here no private ownership of property was recognized, but all wealth Lelonged to the government, and the wants of all were supplied from the common source. All persons labored willingly to contribute to the common stock, all tolerated the religious opinions of others, all received the exact credit to which they were entitled, and, moreover, all were entirely satisfied with their state. The work was published in Latin, but was soon translated into English by Bishop Burnet. The sale of this work has been enormous, and there have been translations into many languages. It gave rise to the familiar epithet Utopian, a term commonly applied to visionary reforms in social and political affairs. "Looking Backward," a work published by Edward Bellamy, is quite similar in many respects to the "Utopia" of More.

UTRECHT (ū'trěkt), a city of the Netherlands, capital of the province of Utrecht, 22 miles southeast of Amsterdam. It occupies an imposing site in a fertile region, being surrounded by beautiful fields, orchards, and flower gardens. The city has extensive railroad connections with other trade centers and additional transportation facilities are provided by two national canals. It maintains a fine system of public schools and is the seat of a musical college, a veterinary school, numerous churches, and the Cathedral of Saint Martin. The University of Utrecht was founded in 1623 and now has an attendance of 875 students, excellent botanical gardens, laboratories, and a fine library. Several bridges cross the canals. The streets are substantially paved and improved by gas and electric lighting, a number of fine monuments, and an extensive system of rapid transit. Among the manufactures are tobacco products, furniture, salt, metalware, carpets, chemicals, textiles, clothing, cordage, and musical instruments. It has an extensive market in live stock, fruits, grain, and dairy products. Utrecht ranks as one of the oldest cities of the Netherlands and dates from the period of Roman occupation. The United Netherland Republic was formed at Utrecht in 1579 and the peace of Utrecht was signed here in 1713. Population, 1906, 114,692; in 1916, 128,386.

UTRECHT, Treaty of, a celebrated peace treaty signed at Utrecht, in the Netherlands, on April 11, 1713, by which the ten years' war of the Spanish succession was concluded. The treaty was agreed to by Prussia, Savoy, England, Portugal, France, and other interested nations. Among the important features of the treaty are that the Hanoverian succession in England was recognized, that the King of Prussia was recognized in his title and received a part of Spanish Guelderland, that Newfoundland, Nova Scotia, Hudson Bay Territory, and several other French possessions were ceded to England, that Nice and Savoy were restored to the Duke of Savoy, who received the title of king and became presumptive heir to the Spanish throne, and that France stipulated not to unite the crowns of France and Spain. The treaty recognized Neuchâtel as a possession of Switzerland and several other minor conditions were included.

UZ, a region mentioned in the Old Testament as the scene of the story of Job. It appears that Job resided in the country east of Palestine, near Edom, where he was visited by his friends Eliphaz the Temanite, Bildad, Zophar, and Elihu.

UZBEKS, **Usbeks**, or **Usbegs**, the name of a people of Turkestan. They belong to the Turkish branch of the Turanian race. Writers class them as the most progressive inhabitants of Turkestan, where they have their chief seats of influence at Bokhara, Khiva, and Khokan. Though some are nomadic, most of them have fixed homes and engage in agricultural and commercial pursuits. In religion they are rigid Mohammedans. They dwelt on the Jaxartes up to the 14th century, when they moved westward. The Russians place their number at 1,500,000



V

V, the fifteenth consonant and the 22d letter of the English alphabet. The letter was derived from the Phoenician through the Greek and the Roman languages, corresponding to the Roman V. It represents a labial or labio-dental consonant sound and is formed by the junction of the upper teeth and the lower lip, as in ov, eve, and vain. The sound of v is produced in the same way as that of f, but differs from the latter in being voiced, while the sound of f is breathed. As a Roman numeral v is used to denote the same value as the Arabic 5 and when a dash is placed above it, as \overline{V} , it represents 5,000.

VAAL RIVER COLONY. See Transvaal. VACCINATION (văk-sĩ-nā'shun), the art of introducing vaccine matter into the human system with the view of providing protection against smallpox, or to render that disease less severe. The vaccine matter generally used is the so-called vaccine virus, obtained from pustular eruptions on the skin of the teats and udders of cows having cowpox, an acute contagious The common method is to cut the skin slightly with a clean lancet point, usually on the upper part of the arm, and then rub the vaccine matter over the skin containing the scratches. Vaccination pustules formed on another person answer the same purpose. Where the vaccination proves successful, inflamed pustules form the third day. Loss of appetite and slight headaches usually occur the eighth day, and the inflammation begins to decrease the tenth day. A scab forms after the pustules are dried up, which usually disappear the twentieth day and leave a slight scar. Jenner is the discoverer of vaccination.

Considerable disagreement has been common among medical men as to the value of vaccination, some alleging that it is no reliable means of protection, and instead recommend strict observance of sanitary and hygienic laws. It is contended by others that successful vaccination either entirely prevents contagion or greatly lessens the severity of the disease. They recommend that a child be vaccinated at about the fourth month after birth and that subsequent vaccinations be made at an interval of six or seven years. Children are refused admission to

VACUUM

the public schools in some countries unless they are previously vaccinated. In 1900 smallpox was epidemic in the United States, Russia, Mexico, France, Germany, and many other countries. It was proven quite conclusively that the disease was most general in sections where vaccination had decreased. Subsequently the health authorities of many cities in the United States ordered general vaccination. In 1901 the authorities of Constantinople made it compulsory to vaccinate, under penalty of a fine.

A notable instance of successful results in the value of vaccination as a protection against smallpox was reported from Porto Rico and the Philippines in 1908, where the disease was The government of the United epidemic. States performed 800,000 vaccinations in these islands and in four months abolished the disease. Formerly the death rate was 6,000 from smallpox, but in the year following the general institution of vaccination no deaths were reported from a large number of districts. This is in practical accord with the experience in Europe in the 18th century, when smallpox was as common as measles. Medical authorities place the death rate from the disease very high in that continent before the value of vaccination was discovered, as high as 15,000,000 in a quarter of a century.

VACUUM (văk'û-ŭm), a space which is devoid of any material substance. Modern experience bears out the view that an absolute vacuum does not exist in nature. practically applied, it is understood that ether fills the space, termed the vacuum, from which the matter has been removed. The most perfect vacuum that could be obtained up to the last century was the space in a carefully filled barometer tube, called the Torricellian vacuum. It is now possible to remove all but about 120 of the air in the receiver of an air pump. In case this is done the air remaining can be exhausted almost entirely by carbolic acid being injected and pumped out several times, after which all traces of remaining air may be removed by moistened caustic potash previously placed in the receiver. The presence of a quantity of sulphuric acid is quite essential in making these experiments. It is now possible to make an exhaustion so nearly complete that the matter remaining is not sufficient to allow an electric spark to pass through it.

VACUUM PAN, a closed metallic retort which is used for boiling down sirup and in making sugar. However, only a partial vacuum is formed within such a vessel, this being accomplished by connecting it with an exhausting apparatus. The use of the vacuum pan permits the liquid to evaporate and concentrate at a lower temperature and a lower atmospheric pressure than ordinarily. It likewise overcomes the danger of burning the sugar and shortens the operation. Vacuum pans may be used in the manufacture of any substance in which a low temperature is required.

VACUUM TUBES. See Geissler, Heinrich. VAILLANT (vå-yän'), Marie Edouard, public man, born at Vierzon, France, in 1840. He studied engineering and medicine in Paris and subsequently pursued courses of instruction in the universities of Tübingen, Heidelberg, and Vienna. In 1870 he returned to Paris, where he was a prominent figure in supporting the commune and officiated as minister of education. At the downfall of the commune he went to London, where he was active in soliciting support for the socialist cause in France, and in 1872 the death sentence was placed upon him. He returned to Paris after the amnesty of 1880, was elected to the municipal council in 1884, and was an active opponent of Jean Marie Boulanger. Subsequently he was twice elected to the house of deputies, in 1893 and 1898, where he attracted attention as an advocate of socialistic measures.

VALDAI HILLS (val-di'), an elevated region of hills in western Russia, about 125 miles southeast of Saint Petersburg. Within these highlands are the sources of the Volga, Duna, and Dnieper rivers. The general elevation is about 310 feet above sea level, but Mount Popovagora is 1,095 feet. Immediately west is Lake Ilmen. The region is well wooded and watered. Fine farms are located in the valleys and lower slopes, while the higher altitudes have fine grasses.

VALDIVIA (vål-dē'vē-ā), a city of Chile, capital of a province of the same name, near the mouth of the Calla-Calla River. It has a well-sheltered harbor at Port Valdivia, on the Pacific coast, about sixteen miles east, and is connected with interior points by railways. The streets are regularly platted, but the buildings are quite low. It has a large export trade in hides, lumber, cattle, and minerals. The place was founded by Pedro de Valdivia in 1551. Population, 1918, 10,452.

VALDOSTA (văl-dŏs'tà), a city in Georgia, county seat of Lowndes County, in the southern part of the State, on the Valdosta Southern, the Plant System, and the Georgia Southern and Georgia railroads. The surrounding country produces sugar cane, corn, tobacco, hay, and

vegetables. Among the noteworthy buildings are the county courthouse, the high school, the public library, and several churches. The manufactures include cigars, clothing, earthenware, and machinery. Among the general improvements are electric lights, telephones, waterworks, and sanitary sewerage. It was settled in 1859 and incorporated in 1860. Population, 1900, 5,613; in 1910, 7,656.

VALENCIA (và-lěn'shǐ-à), a seaport city of Spain, on the Mediterranean Sea, about 200 miles southeast of Madrid. It occupies a convenient site on the Guadalaviar River and has excellent railroad facilities. The streets are narrow and crooked in the older parts, but the newer quarters have broad and handsome thoroughfares and are provided with numerous modern improvements, such as gas and electric lights. It has an extensive system of electric street railways, street pavements, waterworks, and public parks. A broad quay, beautifully improved by avenues of trees, is located along the river. An avenue called the Alameda passes from the quay to the harbor on the Mediterranean. The city is surrounded by fine orchards and vineyards, and through it pass a number of canals and a network of pipes carrying the city water supply. Among the chief buildings is the La Seo Cathedral, a Gothic structure of the 13th century, and near it are a number of chapels. Other buildings of note include the customhouse, several secondary schools, and the university. Valencia is noted for its manufacture of tobacco products, which aggregate 145,-000 pounds per year. Other manufactures include glass, leather, linens, silk and cotton textiles, pottery, soap, machinery, clothing, ironware, and musical instruments. It has a large interior and foreign trade in silk, spirits, cereals, and fruits. The fine climate and convenient transportation facilities make it a favorite summer resort. Valencia was a Roman city, but subsequently became a center of Gothic influence, and in 713 was captured by the Moors. In 1812 it surrendered to the French. Population, 1910, 219,034.

VALENCIA, a city of Venezuela, 30 miles south of the Caribbean Sea and about 82 miles southwest of Caracas. It has railroad connections with Puerto Cabello and is situated in a fertile farming and stock-raising region. The streets are regularly platted and substantially improved by pavements, sewerage, and waterworks. About eight miles east of it is Lake Valencia. The manufactures include cotton and woolen goods, pottery, machinery, cordage, tobacco products, and farming implements. Among the noteworthy architectural structures are a number of schools and churches, several government buildings, and numerous hotels and business establishments. It was founded by the Spanish in 1555. Population, 1918, 42,415.

VALENS (vā'lēns), Flavius, Roman Emperor of the East, born in Pannonia about 328;

slain near Adrianople, Aug. 9, 378 A. D. His brother, Valentinian I., proclaimed him Emperor of the East, in 364, and he received as his share of the Roman dominions all of Thrace, Egypt, and Asia. He began reforms in the empire by greatly reducing taxation, but a lack of prudence caused a number of revolts which were aided by the Goths under Athanaric. A peace was concluded in 370 and, when the Huns drove the Goths southward, in 377, the latter were permitted to settle in Moesia, which was a part of the Roman territory. Subsequently the Romans imposed burdensome taxes upon the Goths, which caused a revolt and a decisive battle between Valens and the Goths near Adrianople. The Roman army was cut entirely to pieces and Valens was slain.

VALENTINE (văl'en-tīn), Basel, eminent alchemist, who flourished in Germany about the 13th century. Little is known of his early life and it is assumed that he was a Benedictine monk at Erfurt, where he appears to have exercised considerable influence in the convent of Saint Peter. He was diligent in searching for the philosopher's stone, which is reputed to turn everything it touches into gold, and wrote a number of works relating to transmutation. His writings are in the Old German dialect, some of which still remain in manuscript form, but a number have been put into print. Among the best known of the published works are those bearing the titles of "Essential Colors of the Seven Metals," "Twelve Keys of Philosophy," and "Tract Concerning Things Natural and Supernatural."

VALENTINE, or Valentinus, a Christian martyr of the 3d century, famous for his piety and acts of charity. Emperor Claudius of Rome caused his arrest and imprisonment and employed Asterius to make an effort to convert him back to idolatry. Valentine received him with great kindness and afterward converted Asterius to Christianity by healing his blind daughter. He suffered martyrdom at Rome in 270, his name being assigned in the calendar to Feb. 14, which is commonly called Saint Valentine's Day. The custom of sending sentimental or comic messages is older than the martyrdom of Saint Valentine. It was long practiced by the Romans on the 15th of February and was associated with the feast called Lupercalia. Anciently it was customary to bestow presents on Valentine's Day, such as garters, gloves, handkerchiefs, and jewelry.

VALENTINIAN I. (văl-ĕn-tĭn'i-ăn), Flavius, Roman Emperor of the West, born in Pannonia in 321; died there Nov. 17, 375 A. D. He was the son of Gratianus, a soldier in the Roman army, and under his father received early military training. Julian recognized in him a military leader of great courage and capacity, but his contempt for paganism caused the emperor to banish him in 362. He was restored to favor the following year and given

command of an army in the East, where he became highly distinguished, and on the death of Jovian, in 364, was chosen emperor by the army stationed at Nicaea. One of his first important acts was to name his brother Valens as Emperor of the East, while he governed Italy, Spain, Gaul, Germany, and Northwestern Africa. His reign of eleven years was wise and able, but there were a number of incursions from Germany, chiefly by the Saxons, Burgundians, and Alemanni. He not only defended the Roman possessions, but made notable improvements, encouraged industries, and reformed the civil service. He died from an attack of apoplexy while treating with ambassadors from Germany. His daughter Galla became the wife of Theodosius I. and his two sons, Valentinian and Gratianus, succeeded him in the government.

VALENTINIAN II., Flavius, Roman Emperor of the West, born in 371; died in 392. He was but four years of age at the death of his father, Valentinian I., while his elder brother Gratianus was seventeen years old. The two succeeded their father in the government, with their residence at Milan. Gratianus retained the Trans-Alpine provinces, while Valentinian received Italy and parts of Africa and Illyricum, the latter being assisted by his mother, Justina. Gratianus died in 383 and his army in Britain rallied to the support of Maximus, who, in 387, invaded Italy. Valentinian and his mother fled to Thessalonica, where they found a friend in Theodosius, the husband of Galla and the Emperor of the East. Theodosius sent a large army into Italy, which defeated Maximus in a decisive battle, thus restoring Valentinian to the throne. Though a liberal sovereign. he was slain by Arbogastes, a Frank commander in the army, four years after his restoration.

VALENTINIAN III., Placidius, Roman Emperor of the West, born in 419; slain March 16, 455. He was the son of Constantius III. and of Placida, the daughter of Theodosius and Galla, and in 425 was declared Emperor of the West by Theodosius II. In the first part of his reign he was assisted by his mother. His government of thirty years was both weak and corrupt, witnessing a rapid decadence of Roman power. In this period occurred the great barbaric invasions under Attila and Genseric, which were long staid with a powerful hand by the Roman general Aëtius. The Vandals under Genseric conquered Africa, but Attila was finally defeated by Aëtius, though the jealousy of Valentinian caused him to kill the latter in 454. The faithful friends of Aëtius joined Maximus in opposition to Valentinian, and he was slain while attending games in the Campus Martius. His death witnessed the extinction of the family of Theodosius.

VALENTINUS (väl'čn-tf-nus), eminent Christian theologian, the most distinguished before Origen, who was one of his students. Little is known of his life, but it is certain that he was born in Egypt and quite probably received his education in Alexandria. He came to Rome about 138, where he lived in the time of Pius (140-155), and was a contemporary of Anicetus (155-166). Valentinus regarded heathenism a preparatory stage of Christianity and combined Greek philosophy with the teachings of the Gospel, treating the latter as the keynote of Greek science. He was the author of several epistles and the founder of a sect known as the Valentinians. Though less advanced in learning than Origen, he surpassed him in the style of thought and in the power of perception. He died at Rome or in Cyprus about 160 A. D. He is considered the founder of gnosticism, a system of philosophy that occupied a middle ground between paganism and Christianity. See Gnosti-

VALERIAN (và-lē'rĭ-an), a genus of plants native to Europe, many of which are cultivated in all the continents. About 180 species have been described, including both annual and perennial plants. Most of these species have fleshy roots, woody fibers, and yield gummy and resinous substances. The alpine valerian is used for perfuming baths and as a substitute for spikenard. Several of the species are valuable for their medical property, which is derived from the root as a volatile oil, known as the oil of valeria. Preparations of it are used in treating hysteria, chorea, and nervous irritability. Cats are peculiarly attracted by the smell of valerian. Wild species are found in some parts of North America, especially in the swamps of New Brunswick, Michigan, and Ver-

VALETTA (và-lěťtà), or La Valetta, a seaport city of Malta, capital of that island, situated due south of Sicily. It is strongly fortified and has a large and commodious harbor. The site of the city is on an elevated neck of land, about two miles long, and at its extreme point is a powerful lighthouse. The streets are platted with considerable regularity, crossing each other at right angles. They are improved with stone pavements, electric lights, waterworks, and several fine squares. Among the chief buildings are the governor's palace, the Cathedral of Saint John, and a number of schools and churches. It has several monuments erected to Italian leaders. The city has a library of 60,000 volumes and a university. The water supply is obtained by an aqueduct nine miles long. It is so named from John de la Valette (1494-1568), grand master of the Knights of Saint John, who successfully defended the island of Malta against the Turks in 1566. Among the industries of the city is shipbuilding. It has manufactures of wine, cotton and silk textiles, pottery, and clothing. It is the seat of a considerable trade in grain, coal, wine, and fruits. Population, 1916, 62,826.

VALHALLA (văl-hăl'la). See Walhalla.

VALKYRIES (vål-kĭr'êz), in Scandanavian mythology, the maidens who attended upon Odin, by whom they were sent to the field of battle to choose those who were to be slain and to turn the tide of battle. They were adorned with golden ornaments and bore the souls of the brave to Walhalla, where they served the heroes with mead from the drinking horn. The number of these maidens is usually stated to have been nine, though more are named in the Elder Edda. In the later writings they are associated with the clouds, usually the white clouds and those that indicate the approach of storm.

VALLADOLID (väl-yà-thô-lèth'), a city of Mexico, in the state of Yucatan, 88 miles southeast of Merida, with which it is connected by railway. It occupies a fine site in the center of a fertile region, which produces cereals, sugar cane, and tobacco. The noteworthy buildings include the city hall, the post office, the Franciscan convent, and the Jesuit College. Among the manufactures are cotton and woolen goods, utensils, tobacco products, clothing, and earthenware. The climate is the best found in Yucatan, hence it is a favorite place for invalids. Population, 1916, 15,206.

VALLADOLID, a city in Spain, capital of the province of Valladolid, 98 miles northwest of Madrid. It is situated on the Pisuerga River, a tributary of the Douro, and has railroad connections with the leading interior and seaport cities of the Iberian peninsula. The climate is genial and healthful, the sky is generally cloudless, and surrounding it is a region noted for its abundance of live stock, cereal crops, and vegetables. Its chief structures include the Plaza de Toros, or bull arena, having a seating capacity for 10,000 persons, and a number of schools, churches, hospitals, and public buildings. It has remains of several fine palaces. The streets are paved and otherwise improved, and within recent years many of the older buildings have given way to fine business blocks and beautiful residences.

Valladolid is noted as an industrial center. Among the principal manufactures are silk and cotton textiles, paper, jewelry, woolens, perfumery pottery, clothing, and machinery. It has a large trade in live stock and grain, considerable quantities being transported by railway and by navigation on the Douro. Valladolid was known as Pincia in the time of the Romans. The Moors called it Belad-Walid, and after their expulsion it was occupied by Ordono II. of Leon. Charles V. improved it by constructing many beautiful buildings and palaces, when it had about 100,000 inhabitants. It began to decline in 1560, when Madrid became the only residence of the Spanish sovereigns. It still maintains a university, an institution that has flourished nearly six centuries. Population, 1910, 67,742.

VALLANDIGHAM (văl-lăn'di-gam).

Clement Laird, public man, born at New Lisbon, Ohio, July 29, 1820; died June 17, 1871. He attended Jefferson College, Pennsylvania, taught in the schools of Maryland, and in 1842 was admitted to the bar in Ohio. Soon after he was elected to the State Legislature and was chosen a member of Congress as a Democrat in 1856. While in that body he became known as an extreme advocate of state rights. Both in Congress and after retiring, in 1863, he severely criticised the administration of Lincoln, which ultimately caused his arrest and sentence to prison in Fort Warren. The sentence was soon changed by Lincoln to deportation across the Confederate lines, whence he went to the Bermudas and later to Canada. His party nominated him for Governor of Ohio in 1863, but he was defeated by a large majority. Later he took part in the organization of the Knights of the Golden Circle, an organization that was friendly to the Confederacy. His death resulted from the accidental discharge of a pistol at a trial, while he was illustrating his theory of how a murder had been committed.

VALLEJO (vál-yā'hō), a city of California, in Solano County, on the Bay of San Francisco, 26 miles northeast of San Francisco. It is on the Southern Pacific Railroad and is an important shipping point. On Mare Island, near the city, is the most important United States naval yard on the Pacific coast. Among the principal buildings are the high school, the Carnegie library, the Sailors' Club House, the Orphans' Home, and the Saint Vincent's Academy. The surrounding country is farming and fruit growing. It has manufactures of ironware, machinery, pottery, lumber products, engines, sailing vessels, and farming implements. The municipal improvements include pavements, waterworks, and electric street lighting. It has a growing trade in farm produce and merchandise. Population, 1910, 11,340.

VALLEY, a tract of land bordered by hills or mountains and usually drained by a stream. A valley is properly a strip of low land between hills or mountains, but in a larger sense the term is applied to the entire basin of a river, as the valley of the Nile and the valley of the Mississippi. Valleys are said to be transverse when they run across a range of mountains, and those that extend parallel to the principal ranges are termed longitudinal. Transverse valleys are usually narrow and have steep sides. Where they occupy high altitudes, as in the Alps, they are known as passes. The Simplon Pass of Switzerland and the Kabul Pass in the Himalayas are noted instances. On the other hand, transverse valleys in low altitudes are termed water gaps, of which the Delaware Water Gap is an in-

Erosion is the chief agency in the formation of a valley. Where the rocks decay and are acted upon by the frost, the erosion is more

rapid, especially if the running stream has a Valleys formed in this way swift current. were originally narrow and bordered by steep walls, but the lapse of time caused them to be widened so as to form level tracts on one or both sides of the stream. In some instances the cause of valleys is assigned to the upheaval and depression of the crust of the earth. Such action is said to be volcanic, but valleys formed in this way are usually much shorter than those resulting from the action of streams. The action of glaciers gives rise to glacial vallevs, such as the fiords of Norway and the firths and lochs of Scotland. Many of such formations are due to the agency of glaciers in the remote past.

VALLEY CITY, a city of North Dakota, county seat of Barnes County, 58 miles west of Fargo. It is situated on the Sheyenne River, on the Northern Pacific, and on the Minneapolis, Saint Paul and Sault Sainte Marie The surrounding country is fertile railways. and produces large quantities of wheat, flax, and vegetables. Among the noteworthy buildings are the county courthouse, the high school, a number of churches, and a State normal school. The enterprises include flouring mills, grain elevators, and machine shops. Electric lighting, waterworks, and sewerage are among the public utilities. It has a large trade in farm produce and merchandise. Near the city is a large double-track viaduct of the Northern Pacific Railroad. This structure was built in 1906, at a cost of over \$1,000,000, has a height of 164 feet, and is about 4,000 feet long. Population, 1905, 4,059; in 1910, 4,606.

VALLEYFIELD, a port city of Quebec, in Beauharnois County, thirty miles southwest of Montreal. It is situated on Lake Saint Francis, the Saint Lawrence River, the Beauharnois Canal, and the Grand Trunk and other railways. Opposite the city, on the north side of the river, is Coteau Landing. The chief buildings include a college, the cathedral, the public hospital, and the Windsor Hotel. Among the manufactures are cotton goods, flour and grist, paper, and machinery. The city has fine water power, electric lights, sewerage, and waterworks. Population, 1901, 11,055; in 1911, 9,449.

VALLEY FORGE, a village of Pennsylvania, in Chester County, 24 miles west of Philadelphia, on the Schuylkill River and the Philadelphia and Reading Railway. It is famous as the place where the American army of 11,000 men under Washington camped in 1777, after the battles of Brandywine and Germantown. The object of camping at this place was partly to protect Congress, which was then in session at York, Pa., and partly to be in a place where its defense would be aided by the hilly condition of the site during the winter. Want of sufficient clothing and food caused great suffering among the men, owing to the incapacity of the commissary department, and

many died from hunger and cold. However, Baron Steuben, who had come from Germany to assist the Americans, rendered valued services by bringing the army up to a better discipline and greater efficiency for service. Washington abandoned the camp on June 18, 1778,

and reoccupied Philadelphia.

VALLOMBROSA (väl-löm-brō'sà), a famous abbey of Italy, situated in a valley between the Apennines of Tuscany, about fifteen miles east of Florence. In the vicinity are fine groves of chestnut, fir, beech, and mulberry trees. It dates from 1038, when Saint Giovanni Gualberto founded a house of monks subject to the rule of Saint Benedict. The chief building was erected in 1637, but, as the monastery was suppressed in 1863, it is at present occupied by the Royal Academy of Forestry, which was opened in 1869. The abbey of Vallombrosa is mentioned by Milton in "Paradise Lost."

VALMY (val-me'), a village of France, in the department of Marne, 35 miles southeast of Rheims. It is famous as the scene of a battle on Sept. 20, 1792, when a German army under the Duke of Brunswick made an attack upon the French under Dumouriez and Kellermann, but was repulsed. The engagement is frequently spoken of as the cannonade of Valmy, owing to the bravery displayed by the assailants under a furious cannonade. It is classed as one of Creasy's "Fifteen Decisive Battles of the World," owing to the fact that it was the first triumph of the new republic estab-

lished in France.

VALOIS (vål-wä'), House of, an eminent dynasty of France. It was a branch of the Capetian dynasty, which possessed the throne from 1327 to 1589. The early monarchs of this line were able and valiant rulers. They successfully resisted the incursions of the English, established the supremacy of the crown over the nobles, and gave France an eminent position among the nations of Europe. Francis I. was one of the noted sovereigns of the house of Valois and was distinguished for his firm disposition and remarkable ability, but his successors were less fortunate and under their government the country became distracted by the rise of powerful nobles, internal dissent, and religious disturbances. Historically, the dynasty dates from 1285, when Philip III. assigned to his younger son Charles the county of Valois, a region now included in the departments of Aisne and Oisne. The Capet dynasty becoming extinct in 1327, the eldest son of Charles of Valois ascended the throne of France as Philip VI., thus founding the Valois dynasty. The sovereigns of the Valois line include the following. Philip VI. (1327-1350); John the Good (1350-1364); Charles V. (1364-1380); Charles VI. (1380-1422); Charles VII. (1422-1461); Louis XI. (1461-1483); Charles VIII. (1483-1498); Louis XII. (1498-1515); Francis I. (1515-1547); Henry II. (1547-1559); Francis II. (1559-1560); Charles IX. (1560-1574); and Henry III. (1574-1589). The dynasty was succeeded in the last mentioned year by the house of Bourbon.

VALPARAISO (väl-på-rī'sō), a city in Indiana, county seat of Porter County, 43 miles southeast of Chicago, Ill., on the Pennsylvania, the Grand Trunk, and the New York, Chicago and Saint Louis railroads. It is surrounded by a fertile farming and dairying country. The noteworthy buildings include the county courthouse, the high school, the city hall, and the Saint Paul's Academy. It is the seat of the Northern Indiana Normal School, an important educational institution of higher learning, having departments of normal training, law, engineering, music, languages, and business training. It is attended by about 1.500 students. The city has manufactures of flour, ironware, clocks, cigars, lumber products, clothing, machinery, and farming implements. It has a growing trade in farm produce, fruits, and merchandise. The place was settled in 1826 and incorporated in 1856. Population, 1900, 6,280; in 1910, 6,989.

VALPARAISO, a city of Chile, on a large bay of the Pacific Ocean, 88 miles northwest of Santiago. It is finely located on the Bay of Valparaiso, on which it has a large and safe harbor, and ranks as the largest city and commercial emporium of the republic. Several railroads connect it with a number of cities on the Pacific coast and a transcontinental line furnishes communication with Buenos Ayres and other cities on the Atlantic seaboard. chief buildings include the customhouse, the union railway depot, several fine churches and schools, and several institutions of secondary learning. It is the seat of a number of hospitals and charitable institutions, several seminaries, and a number of scientific and educational associations.

Valparaiso is one of the leading industrial centers on the Pacific coast of South America. The manufactures include tobacco products, clothing, earthenware, spirituous liquors, vehicles, sugar, machinery, and farming implements. Its interior and foreign trade is important, the commodities including chiefly lumber, minerals, live stock, hides, sugar, cereals, wool, and wine. A chain of forts constructed in 1866 defends the city. Among the general improvements are electric lights, waterworks, and electric street railways. A destructive earthquake visited the region in 1822 and again in 1906. In the latter year a thousand people were killed and 75,000 were rendered homeless. Valparaiso was founded by the Spanish in 1544. Hostilities between President Balmaceda and insurgents occurred at Vina del Mar, three miles northeast of Valparaiso, in 1891. In 1892 a force of Chileans made an attack upon the American ship Baltimore in its harbor, but the difficulties were adjusted by the payment of an indemnity. Population, 1918, 196,348.

VALUE (văl'ū), in economics, the worth of an object estimated by any standard of purchasing power, such as the market price or the amount of money considered equivalent to the utility or cost of it. It has been defined as the estimate of the amount of sacrifice necessary to attain an object that may be desired. However, utility and scarcity are two fundamental factors that enter into the matter of determining the value of any object, and when they are considered together they constitute the so-called law of supply and demand. By utility is meant the qualities in objects that make them desirable. Any object that does not possess utility is not considered of value, since no one would care to make a sacrifice unless the object gratifies some desire. Scarcity may be defined as the absence of an abundance, or as a limited supply when the demand is great, and under such conditions the value becomes proportionately higher. In general, value is spoken of as the price of an article and money is termed the measure of value. See Wealth.

VALVE (vălv) in mechanics, a movable piece in a tube, fitted to act like a door or gate to permit the passage of a liquid, whether in the form of gas, steam, water, or solutions. The valves are variously constructed, depending upon the uses they are to serve. In general, valves may be classed as those operated by hand, by independent mechanism, by the movement of machinery, and by the action of a fluid. Sliding-valves open parallel to the seat, lift or puppet valves rise perpendicularly, and flapvalves rotate in an opening. Pumps and steam boilers are fitted with self-acting valves, since the water or steam open or close them according to the pressure of the fluid upon their surface. Sliding-valves, such as are used in the cylinder of a steam engine, are controlled by some external force, the opening and closing having the effect of regulating the admission or escape of steam:

VÁMBÉRY (väm'bå-rē), Arminius, author and statesman, born in Duna-Szerdahely, Hungary, March 19, 1832. He studied at Pressburg, where he became distinguished as a student of foreign languages, and in 1848 took part in the national revolution. Subsequently he settled in Constantinople, where he studied Oriental languages, and afterward made extensive tours through Asia Minor, Persia, and Turkestan. As a means of protection he traveled in the disguise of a dervish, thus enabling him to visit regions otherwise unsafe for Europeans. In 1864 he became professor of Oriental languages at the University of Budapest and subsequently took an efficient part in opposing the Russians in the East. His writings include "Travels and Adventures in Central Africa," "Mohammedanism in the Nineteenth Century," "History of Bokhara," "Primitive Civilization of the Turko-Tartars,"
"Future Contest for India," and "German-Turkish Dictionary." He died Sept. 15, 1918.

VAMPIRE (văm'pīr), a so-called demon of Southeastern Europe, which is believed by the superstitious to roam about at night in search of persons, whose blood it sucks. The superstition is of Eastern origin and still prevails among the more ignorant classes occupying the region tributary to the Lower Danube. The Lamias mentioned in Greek mythology are similar to the vampire. It was the common belief in the Middle Ages that persons who died under the ban of the church became vampires and were sent forth by the devil to devour the hearts and souls of those with whom they came in contact. New vampires were thought to spring from those killed by other vampires. Some believed that heretics and wizards became vampires at their death. To end the career of a vampire, it was necessary to discover its grave and, after disinterring the corpse, it was pierced with a thorn stake and burned. The belief prevailed that vampires were fond of the blood of both women and men, and that they were especially eager to secure subsistence by destroying youths.

VAMPIRE BAT, the name of a class of small bats, so called from their habit of obtaining subsistence by sucking blood from larger animals. They pierce the skin by a pair of prolonged teeth and usually attack the victim while asleep. The ears are large, the gullet is fitted only for the passage of liquid food, and the wings have a large expanse considering the size of the animal. These bats are pests in some sections in that they attack domestic animals, such as cattle and horses, and have been known to fasten themselves to man during sleep. The common vampire bat is found in the region from Central America to Chile. However, several species of so-called vampire bats of South America are not blood-sucking but, instead, feed upon fruit.

VAN (van), a fortified city of Asiatic Turkey, situated on the eastern shore of Lake Van, 138 miles southeast of Erzeroum. It is the chief city of the vilayet of Van, one of the most fertile regions of Asiatic Turkey. Lake Van is about 5,400 feet above sea level and at the city of Van has a depth of 80 feet, thus affording excellent anchorage for sailing vessels. lake is 80 miles long and 40 wide and has an area of 1,350 square miles. It has no outlet to the sea and its waters are salty. Van is noted for its numerous bazaars, mosques, and Armenian churches, though the streets are not well paved and are quite narrow. Among the manufactures are cotton and woolen goods, earthenware, carpets, and implements. Many caravans visit the city, penetrating thence into Persia, Arabia, and Asia Minor. In the vicinity are many ruins dating from the time of Xerxes. The Asiatic people have a tradition that Semiramis founded Van, but it was named from Van, King of Armenia, who governed the region from 371 to 351 B. C. Population, 1916, 32,645.

VANADIUM (va-na'dĭ-ŭm), a metallic ele-

ment found only in combination with other minerals, discovered by Sefstrom in 1830. It occurs in vanadinite, the vanadate of lead; in volborthite, a copper vanadate; and in a number of others. The metal forms a monoxide with oxygen and combines with platinum to form an alloy. It melts at a very high temperature. Vanadium is used largely with aniline as a dye, for a black pigment, and as the basis of a black ink.

VAN BUREN (văn bū'ren), Martin, eighth President of the United States, born in Kinderhook, N. Y., Dec. 5, 1782; died there July 24,



MARTIN VAN BUREN.

1862. He was the eldest son of Abraham Van Buren, a descendant from the early Dutch settlers of New York. After studying the rudiments of English and Latin in his native town, he entered a law office in New York City, and in 1803 was admitted to the New York bar. He was associated in the law practice at

Kinderhook with James I. Van Alen, and in 1807 married Hannah Hoes. In politics a Democrat, he supported Thomas Jefforson in his national policy, and in 1812 became a member of the New York State senate.

Van Buren was noted as an adroit party manager and was styled in his time "The Little Magician." In 1816 he removed to Albany, though still a member of the State senate, and there formed a law partnership with his lifelong friend, Benjamin F. Butler. He was appointed regent of the University of New York in the same year and in 1821 was elected United States Senator, serving in the same year on a committee to revise the State constitution. He served in the United States Senate until 1828, when he resigned to become Governor of New York. A devoted supporter of Andrew Jackson and a statesman of eminent ability, he was appointed Secretary of State, but resigned from Jackson's Cabinet in 1831 to become minister to The appointment was made in the recess of Congress and when the Senate met, in 1832, that body refused to confirm his nomination, Vice President John C. Calhoun casting the deciding vote against him.

In 1832 Van Buren was elected Vice President of the United States, thus becoming the presiding officer of the body that rejected him as foreign minister. The Democratic party nominated him for President in 1836. He received 170 votes in the electoral college out of 294, but had only 25,000 majority of the popular vote. He was nominated for a second term in 1840, but was overwhelmingly defeated by Gen. William Henry Harrison, the hero of Tippe-

canoe, the latter receiving 234 electoral votes, while Van Buren received only 60. The majority for Harrison in the popular vote was about 140,000. His name was presented to the Democratic national convention at Baltimore in 1844 as a candidate for the Presidency, but James K. Polk received the nomination. The Free Soil party nominated him in 1848, when he received only 291,263 of the popular votes. However, he did not secure any support in the electoral college. In 1852 he supported Franklin Pierce and in 1856 supported James Buchanan.

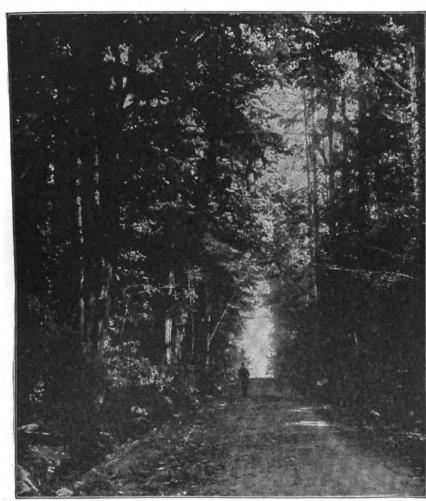
Van Buren was a natural leader of public opinion, a man of generous soul and fine scholarship, and had a large circle of personal friends. The panic of 1837, an outgrowth of excessive speculations, the independent treasury system, and the preëmption law are among the prominent events of his administration. He is the author of a work entitled "Inquiry into the Origin and Course of Political Parties."

VANCE, Zebulon Baird, statesman, born in Buncombe County, North Carolina, May 13, 1830; died April 14, 1894. He became United States Senator in 1879, in which office he took high rank until his death.

VANCOUVER, county seat of Clarke County, Wash., 6 miles north of Portland, Ore., on the Columbia River and on the Northern Pacific and other railroads. It has steamboat communication, electric railways and lumber mills. It has a fine courthouse, high school and public library. Population, 1910, 9,300.

VANCOUVER (văn-koo'ver), an island off the Pacific coast of North America, lying west of British Columbia and northwest of the State of Washington. It is separated from the for-mer by Queen Charlotte Sound and the Strait of Georgia and from the latter by the Strait of Juan de Fuca. The length from southeast to northwest is about 285 miles; width, from 15 to 70 miles; and area, 12,760 square miles. The surface is essentially a mountain range, with a number of fertile valleys and a narrow coast. Splendid forests are abundant in the valleys and mountains. The mountains rise to heights ranging from 3,500 to 6,975 feet. Mount Albert Edward, height 6,975 feet, is the highest summit. It has an abundance of drainage, but the streams are small and unimportant. shores are largely precipitous and rocky and the coasts are indented by numerous inlets.

Many islands abound off the eastern and western shores, most of which are rocky and well timbered. The chief minerals include gold, copper, iron ore, and coal, though the last mentioned is worked most extensively. Mining, lumbering, and fishing are the leading industries. Agriculture and stock raising are pursued successfully. The salmon fisheries are the most important, though other fish abound. It has a considerable fur trade, including the skins derived from the otter, marten, mink, beaver, sable, bear, deer, and seal. The chief soil prod-



ROADWAY, STANLEY PARK, VANCOUVER

The city of Vancouver lies on a long, narrow, ridge-shaped peninsula between two inlets. At the peninsula's point is Stanley Park, one of the most beautiful pleasure grounds in the world. It is a remnant of primeval forest that remains largely in its original condition. Roads and pathways have been constructed in every direction, however, and these converge at points that overlook the deep waters of the bay, where ocean vessels continually pass and repass.

(Art. Vancouver)

-3.		
· ·		
	÷	
		8
		E.
	<u>a</u> .	

ucts include cereals of all kinds, fruits of the Temperate Zone, and vegetables. Among the domestic animals grown chiefly are horses, sheep, cattle, and poultry. The excessive rainfall converts the short streams into torrents, especially in autumn and spring. Vancouver has a climate greatly tempered by the Pacific, its temperature seldom falling below 15° and rarely rising above 85°.

The island is so named from Capt. George Vancouver (1758-1798), who discovered it in 1792, though it had been visited by Juan de Fuca in 1592. Captain Cook surveyed a part of the coast, in 1778, and Captain Vancouver soon after prepared a map of it and of the waters separating it from the mainland. The island was long claimed by the United States, but it has been a British possession since 1846. In 1859 it was made a colony, but it was united with British Columbia in 1866, of which Province it still forms a part. Victoria, on the southern extremity of the island, is the capital of the Province. A railway extends from Victoria to Wellington and the coal fields in the vicinity of Nanaimo. Esquimalt, near Victoria, has a fine harbor and is a station of the royal navy. The inhabitants include 10,000 Wakash Indians.

VANCOUVER, the largest city of British Columbia, county seat of New Westminster County, sixty miles northeast of Victoria. It has a fine harbor on Burrard Inlet, an extension



of the Strait of Georgia, and is the western terminus of the transcontinental line of the Canadian Pacific Railway. The site occupies a rolling tract of land, which rises gradually from the harbor. The streets are platted regularly and improved with substantial pavements. Intercommunication is by a system of electric railways, with which are connected lines that extend to Steveston, New Westminster, and other towns. Stanley Park is a fine public resort and contains much natural scenery of great beauty, including a remnant of primeval forests, through which have been constructed fine roads and pathways. Near the entrance to the harbor is Siwash Rock, one of the most picturesque features of the rugged scenery that beautifies the channel between the city and the open sea. Other parks include East End and False Creek, both beautiful and popular public grounds. The business section lies near the harbor, extending for some distance along the margin of the channel, and beyond it is the residential part of the city.

Much of the architecture is of brick and stone and the larger structures are modern and substantial. The depot of the Canadian Pacific Railroad is centrally located near the harbor and is one of the largest buildings in the city. Other structures of note include the courthouse, the post office, the public library, the Vancouver and the Badminton hotels, and a number of fine schools and churches. It is the seat of Vancouver College, which is affiliated with McGill University at Montreal. Other institutions include Saint James's College, several hospitals, and the military station maintained by the government. The public schools are well organized and generally attended and carry courses from the primary grades to those usually provided in the high schools.

The harbor is sufficiently deep for the admission of the largest seagoing steamers. Regular steamship lines are maintained with Victoria, Seattle, and ports in South America and Asia. The surrounding country produces large quantities of fruits, cereals, lumber, and live stock, hence contributes largely to the trade in produce as well as in minerals and merchandise.

It has extensive railroad machine shops. Among the manufactures are lumber and lumber products, furniture and glass, sugar and canned fruits, carriages and wagons, malt and distilled liquors, clothing, brooms, vinegar, soap and cigars. The city has a large wholesale and jobbing trade, both inland and coastwise.

The site of Vancouver was an unbroken forest in 1885, when the officials of the Canadian Pacific Railway decided to make it their western terminus. Many buildings were erected immediately after this decision was reached and the town was platted the following year. A fire destroyed the larger part of it soon after, but it was rebuilt

rapidly and has had a remarkable growth since. Population, 1901, 28.895; in 1911, 123,902.

VANDALS (văn'dalz), a brave and warlike people of ancient Germany, who were confined chiefly to the region between the Oder and Vistula rivers. In the 2d century A. D., they occupied the region of the Riesengebirge, in southern Germany, and in the following century joined the Goths in making incursions into the Roman province of Dacia. They were permitted by Constantine to make settlements in Pannonia, where they dwelt in peace for sixty years and became Arian Christians. In the 5th century they formed an alliance with the Alani, Suevi, and other Germanic tribes and entered upon a successful invasion of Gaul, where they held sway for three years. Subsequently they

invaded the Spanish peninsula, and in 429 an army of 75,000 under Genseric crossed the Strait of Gibraltar into Africa. There they came in contact with the Roman army of Valentinian III., with whom they made a short truce, but Genseric conquered Carthage in 435. A peace treaty concluded with Rome recognized the authority of the Vandals over Northwestern Africa, Corsica, Sardinia, and part of Sicily.

The Vandals, still eager for conquest, invaded Italy in 455 and soon after captured Rome. On the death of Genseric, in 477, the leadership of the Vandals passed to his son, Hunneric, who warred against the Moors and persecuted the Catholics. Subsequent leaders were less energetic, owing largely to the influence of the tropical climate of Africa, and they were finally subdued by a Roman army under General Belisarius in 533, in the reign of Emperor Justinian. Gelimer, the last African leader of the Vandals, was captured in Numidia and in 534 was carried to Constantinople. The remaining remnant of the Vandal army was sent along with Roman soldiers to participate in the wars against Persia. Vandalism is a term used to express hostility to art and literary treasures and to describe destruction or defacement of property, the word originating from the practice of the Vandals. Several writers assert that some of the Berber tribes of North Africa are direct descendants from the Vandals, basing their statements upon the circumstance that they have blue eyes and blonde hair.

VANDERBILT (văn'der-bilt), Cornelius, capitalist and philanthropist, born near Stapleton, Staten Island, N. Y., May 27, 1794; died in



CORNELIUS VANDERBILT.

New York City, Jan. 4, 1877. He descended from a family of Dutch settlers, who reached New York in the early history of colonization. Though largely deprived of school advantages, he showed remarkable skill as a financier and business man. In 1810 he began to run a boat to

passengers to New York City, and by judicious management amassed \$10,000 by the time he reached the age of 23 years. Thomas Gibbons employed him as captain of a steamboat plying between New York and New Brunswick, N. J., where his wife managed a hotel and lodging house. In 1829 he left the service of Thomas Gibbons to build and manage steamboats on his own account, instituting several successful lines on the Hudson River and the waters surrounding Long Island. He established a line to New Orleans and San Francisco, in 1851, and two years later founded an ocean steamship line to Havre, France.

When the Civil War broke out, he gave up the line to France and presented the United States government with the steamship Vanderbilt, a fine vessel costing about \$850,000. After the close of the Civil War he withdrew his investments in steamship lines to place his capital in railroad stocks. This was the beginning of his vast fortune and leadership in railroad enterprises. He secured control of a number of railroads and established the New York Central and Hudson River Railroad, an important and profitable line. His control extended over 2,000 miles of railroad lines in 1873. He gave \$50,000 to purchase the Church of the Strangers in New York City and appropriated \$1,000,000 to found the Vanderbilt University (q. v.).

VANDERBILT, Cornelius, capitalist, son of William Henry Vanderbilt, born at New Dorp, N. Y., Nov. 27, 1843; died Sept. 12, 1899. He was educated privately and began his business career as a banking clerk in New York City. In 1865 he took a position with the New York and Harlem Railroad Company, of which he was treasurer a number of years. He was made chairman of the board of directors of the New York Central Railroad in 1886, and for many years was associated in an official way with numerous railroad corporations. Besides extending aid to the Vanderbilt University, he was a liberal patron of Yale University and several other institutions.

VANDELBILT, William Henry, son of Cornelius Vanderbilt, Sr., born at New Brunswick, N. J., May 8, 1821; died Dec. 8, 1885. He

attended a grammar school and later received private instruction. At the age of eighteen years he became a bank clerk and in 1864 was associated with his father in the management of the New York and Harlem



WILLIAM HENRY VANDERBILT.

Railroad. As a business man he was singularly successful and his energies were devoted to the development of the Vanderbilt system of railroads. In 1877, at the death of his father, he became president of the New York Central and Hudson River lines. These lines were soon closely affiliated in business with numerous western railways, including the Lake Shore and Michigan Southern and the Chicago and Northwestern railroads. He made many gifts to Vanderbilt University and other institutions and paid the expense of moving the Egyptian obelisk to Central Park, New York City.

VANDERBILT, William Kissam, capi-

talist, son of W. H. Vanderbilt, born on Staten Island, N. Y., Dec. 12, 1849. He received an academic education in the United States and later studied at Geneva, Switzerland. After returning to America, he took up the work of a clerk in a railway office. He was made vice president of the New York Central Railway, in 1877, and in 1883 became chairman of the board of directors of the Lake Shore and Michigan Central Railway. Later he was prominent as a member of the board of directors of numerous railroads and was associated with the Pullman Company and the American Horse Exchange. He erected a fine building for the benefit of his railway employees and contributed liberally to charities.

VANDERBILT UNIVERSITY, an institution of higher learning at Nashville, Tenn., which owes its foundation to a gift of Cornelius Vanderbilt of New York. The first donation, made in 1873, amounted to \$500,000, but the entire gift of Mr. Vanderbilt was \$1,000,000. W. H. Vanderbilt, son of the founder, made gifts at various times that amounted to nearly half a million dollars. Later substantial contributions were made by Cornelius Vanderbilt, grandson of the founder, and by W. K. Vanderbilt. The institution has been the recipient of donations from other parties, notably from citizens of Nashville, including the gift of about \$100,000 made by Mrs. Mary J. Furman for the erection of a chemical laboratory.

Vanderbilt University opened its doors in 1875. At present it is organized in seven departments; namely, academic, engineering, biblical, law, medicine, dentistry, and pharmacy. Most of the university work is done on the campus, a tract of 80 acres in the western part of Nashville, which is far-famed for its beauty of situation. The campus is occupied by a number of university buildings, homes for some of the faculty, and athletic grounds. It has a wellequipped library with about 65,000 volumes. The university is noted for its high standard of admission and strict requirements for degrees. About 900 students are enrolled annually. The list of alumni numbers nearly 5,000. At present the total endowment exceeds \$1,500,000, while all the property has a valuation of more than \$4,500,000.

Vanderbilt University has exercised a wide influence over the institutions of the South in the matter of scholarship and in athletics. It has influenced the organization of the Southern Association of Schools and Colleges, which is intended to promote a high standard of college work with its requirements for admission. Another organization, the Southern Intercollegiate Athletic Association, was originated in this institution and has had a wide influence in promoting pure athletics in the colleges of the Every southern State is represented South. among the students, while only about half of the total attendance is from the State of Tennessee. Chancellor J. H. Kirkland, who has done much

to promote the growth and influence of the institution, was elected to that position in 1893.

VANDERLYN (văn'der-lin), John, painter, born in Kingston, N. Y., Oct. 15, 1776; died there Sept. 24, 1852. He first worked as an apprentice in a wagon shop, where he showed evidence of skill in drawing, and was afterward assisted by Aaron Burr in taking instruction in painting in New York City. In 1796 he went to Paris to study art, where he remained until 1801. He returned to America in the latter year and soon became noted for his excellent productions, but two years later returned to Paris, remaining there until 1818. The works of Vanderlyn are true to life and show much skill in tint and colors. His most famous paintings include "Ariadne," "Marius Amid the Ruins of Carthage," "Murder of Jane McCrea by the Indians," and "Landing of Columbus." He painted a large number of excellent portraits, including those of George Washington, Andrew Jackson, James Monroe, John C. Calhoun, James

Madison, Joseph C. Yates, and George Clinton. VAN DER STUCKEN (stoo'ken), Frank, composer and musical conductor, born at Fredericksburg, Texas, Oct. 15, 1858. His parents took him to Antwerp in 1864, where he studied music under Pierre Benoit (1834-1901), and later pursued a musical course at the University of Leipzig. In 1878 he began a tour of two years through Europe and for a year, from 1881 until 1882, was kapellmeister at the city theater of Breslau. Subsequently he returned to America and was chosen leader of the Arion Society in New York. In 1885 he was made director of the Cincinnati Conservatory of Music, where he later became leader of the orchestra. His opera entitled "Vlasda" was first produced in 1883. Among his later productions are "Inauguration March," "Festival March," and "Festival

Hymn.'

VAN DIEMEN'S LAND. See Tasmania. VAN DORN, Earl, soldier, born at Port Gibson, Miss., Sept. 17, 1820; died May 8, 1863. He graduated at West Point in 1842 and took part in the Mexican War, in which he saw active service at Contreras, Cerro Gordo, and Churubusco. At the capture of the City of Mexico he was wounded. In 1849 he took part in the war with the Seminoles and later with the Comanches. During the Civil War he fought efficiently in the Confederate service. At the beginning of the war he raised a regiment in Texas, of which he became colonel, and in 1862 was promoted to the rank of brigadier general. He was defeated at Pea Ridge in 1861 and was again defeated at Corinth in 1862. Pemberton superseded him, but he continued in active service and won an engagement at Holly Springs, during the Federal attack upon Vicksburg. He was shot at Spring Hill on account of a personal quarrel.

VAN DYKE (văn dīk'), Sir Anthony, eminent painter, born in Antwerp, Holland, March 22, 1599; died in London, England, Dec. 9, 1641. He was apprenticed to Henry Van Balen, a painter of Antwerp, in 1609, and afterward studied under Rubens. In 1620 he left the studio of the latter to spend five years in Italy, where he came in touch with master artists in Rome, Genoa, and Venice. Charles I. invited him to England in 1632, owing to his high reputation as a portrait painter, and soon after knighted him and made him the recipient of a fine residence and an annual pension of \$1,000. Van Dyke is counted the greatest of all portrait painters, except Titian, and his diligence was sufficient to produce a large number of excellent portraits, several historical paintings, and a number of productions founded on mythology. Though fond of splendor and expensive style, he left a large fortune at the time of his death. He married Mary Ruthven, granddaughter of the Earl of Gowrie. His paintings include "Saint Augustine in Ecstasy," "Saint Rosalia Crowned by the Infant Savior," "Samson and Delilah," "Adoration of the Shepherds," and "Elevation of the Cross. Among his portraits are those of members of the royal families of the Netherlands, Germany, and England. His remains were buried in Saint Paul's Cathedral, near the tomb of John of

VAN DYKE, Henry Jackson, clergyman and author, born in Germantown, Pa., Nov. 10, 1852. His father, Henry Jackson Van Dyke (1822-1891), was a noted pastor and under his direction the son received a careful education. After studying at Brooklyn Polytechnic Institute and Princeton College and Theological Seminary, he took a course of higher work in the University of Berlin, Germany. In 1878 he became pastor of the United Congregational Church of Newport, R. I., and from 1882 to 1899 was pastor of a Presbyterian Church in New York City. He resigned the latter pastorate to became professor of English literature at Princeton University. Van Dyke was long corresponding editor of the Philadelphia Presbyterian. His writings include "The National Sin of Literary Piracy," "The Poetry of Tennyson," "The Gospel for an Age of Doubt," "Straight Sermons to Young Men," "The Christ Child in Art," "The People Responsible for the Character of Their Rulers," "The First Christmas Tree," "Story of the Psalms," "Reality of Religion," and "Toiling of Felix and Other Poems." He published a series of articles on "Gospel History in Italian Painting!

VANE (vān), Sir Henry, statesman, born in London, England, in 1612; executed June 14, 1662. He descended from a distinguished family and, after studying at Oxford University, made an extensive tour through France and Switzerland. His contact with Puritans caused him to became confirmed in his opposition to the Anglican Church. In 1635 he came to Boston, where he was made Governor of the Massachusetts colony the next year. He was a sympathizer of

Anne Hutchinson, which caused him to lose popularity with the Puritans, and, after serving as Governor for two years, he was defeated by Winthrop. In 1637 he returned to England, where he was elected to Parliament, became joint Treasurer of the Navy, and was knighted. He was reelected to Parliament in 1640 and became a noted leader in the proceedings of the Long Parliament.

When the war broke out between Parliament and Charles I., Vane resigned as Treasurer of the navy, but was replaced in that office by Parliament. He joined Cromwell in demanding religious liberty for all, but in other matters was his opponent. He served as a commissioner to preserve peace with Scotland in 1646, and was one of the leading statesmen at the time of the Commonwealth. After the death of Cromwell he became a leader of the Republican party. On the restoration of Charles II., in 1660, he was arrested and imprisoned in the Tower. Though the king had promised to spare his life, he was tried on a charge of high treason, found guilty, and condemned to die. Vane is described as an unwise and restless man, one who was a real thorn in the flesh of Cromwell. He wrote "The Retired Man's Meditations," "The People's Case Stated," and "A Healing Question Propounded and Solved."

VAN HISE, Charles Richard, educator and geologist, born in Fulton, Wis., May 29, 1857. He attended the public schools and the University of Wisconsin, where he graduated in 1879, and was instructor there until 1903, when he was made president of that institution. In 1883 he became associated with the United States geological survey, in which capacity he was geologist of the Lake Superior division. He was made geologist for the Wisconsin geological and natural historical survey in 1897, and subsequently published a number of important reports relating to pre-Cambrian and metamorphic geology. For some years he was editorial writer for the Journal of Geology. Among his chief publications are "Principles of North American Pre-Cambrian Geology," "Crystal Falls Iron-bearing District of Michigan," "Iron Ores of the Lake Superior Region," "A Treatise on Metamorphism," "Marquette Iron-bearing District of Michigan," "Penokee Iron-bearing Series of Michigan and Wisconsin," and "Menominee Iron-bearing Districts of Michigan."

VANILLA (vå-nĭl'la), a genus of climbing orchids, which are native to the tropics. They supply the perfume and flavoring extract known as vanilla. The plants spring from the ground and climb with twining stems on trees, usually to the height of fifteen to thirty feet, and in their upward growth produce fibrous roots that draw a portion of the plant food from the tree. Most species have a four-sided and juicy stem and fleshy leaves. These plants produce an abundance of deliciously fragrant, large flowers. The fruit, known as the vanilla bean, is a pod six to

nine inches long, opening at the side, and in it are a number of oily seeds. Several species of the plant are cultivated in Mexico, whence a large portion of the vanilla sold in the market of Canada and the United States is secured.

Vanilla is cultivated in various parts of South America, the West Indies, and tropical Asia as a commercial product. The beans are gathered before fully ripe. They are treated under a complicated process of fermentation to develop the rich aroma and are afterward dried under protection from the sun. Vanilla beans exported for use in foreign countries are sealed in receptacles to prevent the odor from being dissipated. The process of extracting the aromatic flavor is quite complicated and the genuine extract is somewhat expensive. It is placed in carefully sealed bottles, in which form it is sold in the market. Adulterations are made by mixing the extract of the tonka bean, a product of a tree native to Guiana, with the vanilla extract. The product made in this way is similar in odor, though not so pleasant and far less enduring.

Vanilla is used to flavor confectionery, in culinary arts, in the preparation of liquors, and in medicine as a stimulant. Leaves of the vanilla plant are gathered in Florida and shipped to Europe, where they are employed to impart a fine scent to cigars and tobacco. The usual method of scenting is to lay the leaves among the newly made cigars, or in cutting portions of

them with smoking tobacco.

VAN RENSSELAER (văn ren'se-ler), Stephen, the eighth patroon, an American statesman, born in New York City, Nov. 1, 1765; died at Albany, N. Y., Jan. 26, 1839. He descended from the distinguished Dutch family bearing his name. The first of the family connected with American history was Killian Van Rensselaer (1595-1644), who acquired a vast estate near Albany, N. Y., now including three entire counties. Stephen Rensselaer was educated at Harvard University and married a daughter of Gen. Philip Schuyler in 1783. After improving his estate, he engaged in politics as a Federalist and from 1791 to 1795 was a member of the New York senate. He was a lieutenant governor from 1795 until 1801 and served as a member of the New York assembly a second time from 1808 to 1810. In 1812 he was appointed to command the United States army as major general, but, his recruits being inexperienced, met with defeat at Queenstown Heights (q. v.).

He was a canal commissioner from 1816 to 1839 and as such was instrumental in making the construction of the Erie and Champlain canals a reality. In 1819 he was made regent of the University of New York and afterward became its chancellor. To obtain accurate information of the State, he employed surveyors to make a geological survey, paying the expenses from his private funds. From 1823 to 1829 he represented New York in the United States Congress and in 1824 founded the Rensselaer

Polytechnic Institute, an institution for teaching theoretical and practical science, at Troy, N. Y. Yale University granted him a degree in 1825. He published "An Agricultural and Geological Survey of the District Adjoining the Erie Canal."

VAN WERT (văn wert'), a city of Ohio, county seat of Van Wert County, 76 miles southwest of Toledo, on the Pennsylvania and the Cincinnati Northern railways. It is surrounded by a fertile farming country. The chief buildings include the county courthouse, the high school, the Brumback Library, and a number of fine churches. Among the manufactures are machinery, musical instruments, clothing, lumber products, and utensils. It has electric lighting and a system of waterworks. Population, 1900, 6,422; in 1910, 7,157.

VAPOR (vā'pēr). See Evaporation.

VARICOSE VEIN (văr'i-kos), the name applied to a vein that is permanently dilated. The cause of such a diseased condition is due to some obstruction to the return of blood through the affected vein. In some instances the obstruction may arise through constant pressure, as in the case of a varicose condition of the veins of the lower limbs, which usually results from long continued maintenance of the upright posture. The disease sometimes obstructs the heart itself, or results from pressures of tumors. In some instances the disease is very annoying and painful, being frequently attended by a feeling of fullness and numbness. The treatment usually involves rest and bandages applied to the affected parts.

VARIETY (và-rī'ē-ty), the name applied to a group of plants or animals that approach very near to each other in important characteristics. The term signifies a relationship less distinct than that implied by the word species. Some naturalists do not admit of the use of the word variety, except inside the circle of domesticated species, though they sometimes apply it where the stages of growth and sexual characteristics are similar. More recently the word variation has come into use. It has reference to the phenomena of structural or functional deviations from the type or form of the parent. This characteristic varies greatly in different species. For instance, the turkey shows no variation in Europe from the species in America. This is true of the guinea fowl, which has not departed from the African type since being naturalized in America. On the other hand, there is a marked variation in the dog when transported and reared through successive generations under the influences of widely different environments. Cultivated plants and domestic animals are peculiar for this property, giving rise to a great variety of forms that differ widely from the original

VARNA (vàr'nà), a city of Bulgaria, on the Bay of Varna, an inlet from the Black Sea. It is near the mouth of the Pravadia River, has an open harbor, and is connected by a railway with the Danube. The chief buildings include a gymnasium, the townhall, and a number of mosques and churches. It has a large trade in cereals, live stock, textiles, and dairy products. Population, 1916, 35,645.

VARNISH (vär'nish), a resinous solution of certain gums or resins, used by painters and cabinetmakers to produce a shining, transparent, hard coat on a surface. Varnishes are prepared by dissolving resinous substances, such as lac, copal, mastic, or anime, in fixed or volatile oils. The product secured is termed oil varnish or spirit varnish, the latter being prepared largely by a mixture of alcohol and oils. An excellent varnish is made of amber, but it dries slowly and is expensive. Copal is used more largely than any other gum in preparing oil varnishes and is next in durability to amber. Canada balsam is employed in preparing crystal varnish for maps or drawings, being dissolved for that purpose in the purest oil of turpentine. Anime varnish, the product of an organic substance obtained by distillation from bone oil, is employed to some extent. While it dries quickly, it is liable to crack, owing to its lack of toughness. Common resin, dissolved under heat in turpentine or linseed oil, forms the varnish in general use. Its brilliancy is due to the addition of other substances. The ingredients of varnishes necessarily depend upon the purposes for which they are to be used, but the general constituents include asphalt, sealing wax, turpentine, shellac, rosin, copal, amber, mastic, linseed oil, oil of turpentine, benzoin, powdered glass, and dammar.

VARRO (văr'rô), Marcus Terentius, eminent poet and historian, born in Rome, Italy, in 116; died in the year 28 B. C. He belonged to a Sabine family, which had its seat in the town of Reate, and studied under Praeconinus and the philosopher Antiochus. In his political and military career he sided with Pompey, under whom he served in Spain as legate. The superior forces of Julius Caesar compelled him to surrender, but largely because his legions joined the enemy. Subsequently he proceeded to Epirus before the Battle of Pharsalia, and, when Pompey was finally defeated, he surrendered to Caesar. The latter pardoned him and made him collector of the public library at Rome. The second trium-virate, formed by Lepidus, Antony, and Octavian, included his name among the list of proscribed, but Varro saved himself by concealment and was afterward protected by Octavian. The remainder of his life was spent in study at Rome, where he was given permission to occupy his villas and use his library, which had been confiscated. The writings of Varro were numerous, but only one is extant. It is a philosophical dialogue entitled "Rerum Rusticarum, Libri III." His other writings were devoted chiefly to philosophy, history, poetry, and language. Writers credit him with being the author of 74 works in about 500 books.

VARUS (vā'rūs), Publius Quintilus, Roman general, celebrated for his part in the campaigns against the Germans. He became consul of Syria in 13 B. c. and afterward was made its governor. In 7 A. D. he was sent by Augustus as governor to the territory between the Elbe and the Rhine, after that section had been conquered by Drusus and Tiberius. An insurrection was organized in the year 9 A. D., under the leadership of Arminius, and the Romans were totally defeated in the forests of Teutoburg. Varus ended his life by committing suicide. This defeat turned the tide of Roman conquest and the Romans were never able to reconquer the region.

VASE, a vessel of an ornamental character, usually made of pottery, but sometimes of glass, stone, or metal. Vases were used extensively among the people of ancient times and throughout the ages have had very artistic forms. Many ornamental designs have come down to us from the Greeks, Etruscans and Romans. Throughout the Middle Ages vases of beautiful form and artistic design were produced in Europe, and many of these products are seen in the museums and other art collections. China and Japan take high rank in the production of these vessels in modern times, many of which are made of porcelain, usually colored and finely glazed. Artistic vessels of a high class are now made in many countries of Europe and America, the designs and workmanship comparing favorably with the better styles of Grecian vases, though the attention paid to work of this kind is not materially extensive. See Pottery.

VASELINE (văs'ê-lĭn), a substance obtained in the purification of crude petroleum, consisting essentially of a mixture of parafines. It is yellowish, translucent, and nearly odorless and tasteless. The chief uses of this product are in the arts, especially as a base in making pomade, ointment, and cold cream. It has considerable value as a lubricant and as a coating to protect steel surfaces and instruments from rust.

VASSAR (văs'ser), Matthew, philanthropist, founder of Vassar College, born in Norfolk, England, April 29, 1792; died in Poughkeepsie, N. Y., June 23, 1868. He accompanied his father, James Vassar, a French Protestant, to America in 1796, and soon after settled on a farm near Poughkeepsie, N. Y. His father established a brewery in Poughkeepsie in 1801. Matthew Vassar succeeded to the ownership of the brewery after the death of his father and derived large profits from brewing ale. He decided to devote a portion of his fortune to the founding of a school for the higher education of women and in 1861 donated \$400,000 for that purpose, the institution becoming known as Vassar College. This institution offered superior advantages in practical education and scholarship, thus making it a very popular and prosperous center of learning. At his death the bequests made by his will increased this gift to



Turkish or Rhodian Vase of the 16th Century.

Sèvres Vase of 1756.

Meissen Vase Mounted in Ormolu.

Chinese Plum-blossom Jar of the K'ang-hsi Period. Egyptian Vase of the 5th Century A. D.



about \$800,000. In the beneficent enterprise of founding an educational institution with advanced courses, he may be considered a pioneer, and his splendid example has had many imitators.

VASSAR COLLEGE, an educational institution at Poughkeepsie, N. Y., located near the Hudson River, 73 miles from New York City. It was founded by Matthew Vassar in 1861 and was the first well equipped institution for the higher education of women. In 1865 it was formally opened with 353 students. The preparatory department was abolished in 1888. Special schools of music and painting were maintained for a few years, but since 1892 the college has offered only a four years' course for the A. B. degree and a year of graduate work for the A. M. degree. The institution has 23 departments, a faculty of 95 members, and about 1,000 students. The original endowment of \$400,000 has been increased to \$2,500,000. In accordance with the wish of the founder, Vassar College is distinctly Christian in its aims and influence, but it is non-sectarian. A number of fellowships and scholarships are awarded annually. The buildings include the Thompson Memorial Library, one of the finest of academic libraries, containing about 60,000 volumes. Other buildings include the chapel, with a seating capacity of 1,500, the recitation hall, three laboratories, the museum for the scientific and art collections, an observatory, a gymnasium, an infirmary, six halls for residence, and seven houses for the president and professors. The farm and garden with the collage campus include about 900 acres. James Monroe Taylor, who has been an influential factor in building up the institution, was elected president in 1886.

VATICAN (văt'i-kan), the palace of the pontiffs at Rome, now the official residence of the Pope. It is situated on the Vatican Hill, whence its name, on the west bank of the Tiber, and immediately north of the Cathedral of Saint Peter's. Besides the papal palace, the buildings include the great library and museums, the court and garden of Belvidere, a series of chapels, and a number of immense reception halls. Pope Eugenius III. built the present palace in 1145-1153 and his successors enlarged it and added vast embellishments. It includes twenty courts of great beauty and has about 11,000 rooms of different kinds. The treasures stored within the buildings are of immense value, both historically and from a financial view. Many of the apartments are of unrivaled beauty and elegance. The Sistine Chapel, built by Sixtus IV., is noted for its fine music. The Pauline Chapel and the Capella Nicolina contain some of the grandest frescoes extant. These and the vast art galleries possess some of the finest works left by Raphael, Michael Angelo, and Perugino, besides master productions of other famous artists. Some of the most valuable collections in the world are stored in the museums, especially rare specimens of ancient statuary and stones bearing inscriptions relating to noted saints, scholars and sovereigns.

The statues of note include "Faun Playing on a Flute," "Mercury," "Diana, a Fighting Amazon," and "Bacchus Riding on a Tiger." Other noted sculptures in the Vatican are the originals of the groups known as "Laocoön and His Sons," "Ariadne," and the "Apollo Belvidere." The famous Vatican Library, founded in 1378, has about 250,000 printed volumes, including 2,500 editions dating from the 15th century, and besides these are about 26,000 rare manuscripts. This library is in a building erected by Sixtus V. in 1588. More importance is attached to the contents of the buildings than to their architectural effect, though the entire group of structures with their fine gardens and monuments constitute a vast aggregation of wealth and artistic beauty, which is the chief attraction for tourists visiting Rome. The Vatican has been used by the popes as a place of residence since their return from Avignon in the latter part of the 14th century, and new popes are elected by the conclaves that meet here. It has been the only papal residence since 1860, when Rome became the capital of United Italy.

VATICAN, Council of, the ecumenical council convoked by Pope Pius IX. to meet in the Vatican on Dec. 8, 1869, and prorogued on Oct. 20, 1870. At the opening sitting 719 prelates were present and the attendance increased to 764 in the following year, the entire membership being constituted of dignitaries belonging to the Roman Catholic Church. Two so-called constitutions were adopted, one treating of the primary truths of the church, faith, revelation, and the connection between faith and reason, and the other of the primacy of the Roman see, in which the papal claim to authority over Christians was defined. The former was unanimously adopted in a session of 667 prelates and was confirmed by the Pope on April 20, 1870. Among the points of interest in this constitution is the one in which the claim is made that a jurisdiction over the whole church was directly conferred on Saint Peter, and that this primacy or jurisdiction rests in the line of Roman pontiffs, who are regarded successors to Saint Peter. The second constitution, which defines the personal infallibility of the Pope when speaking officially on doctrines of faith or morals, led to a long discussion and received the votes of 535 prelates, while two voted against it, and the remaining members were absent from the session held on July 18, 1870. The decree was promptly confirmed by the Pope. Though the council is technically still in existence, there have been no sessions since its prorogation, which had the effect of a virtual dissolution.

VAUDEVILLE (vod'vil), the name applied to a kind of dramatic entertainment, so called from Les Vaux de Vire, the name of two valleys in Normandy. Oliver Basselin wrote 2.

3024

number of satirical songs relating to current events which he named vaudeville, and this term has continued to be applied to light plays that are interspersed with dancing and comic acting. In the general vaudeville is a series of acting and singing. However, the different numbers are not closely related in style or subject.

VAUDOIS. See Waldenses.

VAUGHAN (van). Herbert, prelate and writer, born in Gloucester, England, April 15, 1832; died in 1903. After studying at Stonyhurst College, he pursued advanced work in Rome and in 1854 was ordained priest. He returned to England soon after and founded Saint Joseph's Foreign Missionary College, in Mill Hill, Middlesex. In 1871 he came to the United States to aid in promoting Catholic missionary work among the Negroes, and, on returning to England the following year, was made bishop of Salford. He became Archbishop of Westminster in 1892, and was soon after raised to the dignity of a cardinal. Vaughan is noted for his earnest work in favor of temperance and commercial education and as an efficient pulpit orator. As head of the Roman Catholic Church in England he wielded a wide influence. He had a proprietary interest in the Dublin Review, hence many of his writings were published in that periodical.

VAULT (valt), an extended arch, or an arched roof, so constructed that the stones, brick, or other materials composing it sustain each other and support a weight, as in a bridge or building. The art of vaulting was practiced by the Egyptians, who constructed the semicircular arch, a form of vault extending from one end of an apartment to the other, which is still employed for various purposes. Vaults of this kind were common among the Romans, but in later years they added groined vaulting, that is, structures formed by two vaults intersecting at right angles. Groined vaulting was utilized extensively in bridging streams during the Middle Ages and more recently in various forms of temple architecture. The names now applied to different kinds of vaults include semicircular or cylindrical, groined, Gothic, and diagonal. A surmounted vault is one having a height greater than half its span and a surbased, less than half its span. Modern architecture presents many fine specimens of vaulting, but steel and iron are fast superseding both arches and vaults, especially in bridges, roofs, floors, and other parts of buildings

VAUXHALL (vaks'hal), the name of a public garden in London, which was famous as a public resort for two centuries after the restoration in 1660. It occupied a place in Lambeth, near the manor or landed estate called Fulke's Hall, whence its name. The visitors at Vauxhall spent their time in various pastimes, largely of a loose character, thus causing the place to be mentioned by a number of novelists and dramatists. Thackeray's "Vanity Fair" makes frequent allusions to it.

VEDAS (vā'daz), meaning inspired knowledge, the name of the sacred scriptures of the Brahmans, comprising the earliest system of philosophy which we possess. Though the date of the origin of these writings is unknown, it is fixed by most scholars within the period between 1600 and 1400 B. c. These writings are divided into four works or books, according to the time in which they were written, and include the Rig-Veda, Yajur-Veda, Sāma-Veda, and Atharva-Veda. All are held to be divinely inspired. The Rig-Veda is the oldest of the Vedas and the Atharva-Veda is the latest. Trayi is a title used to describe the first three, the term meaning three-fold. Since the Vedas vary greatly in time and authorship, they represent a general evolution of thought and worship from the simpler forms to the more thoughtful and reflective, but the newer contain a greater complexity of rites. Each Veda is divided into three parts: the Sanhita, the Brahmana, and the Jnana or Upanishads. The Sanhita is a collection of hymns and prayers called ganas, or mantras, the Brahmana relates to rituals, and the Jnana comprises the philosophical portion. Monotheism, the doctrine that there is but one God, is the basic teaching of the Vedas, but a form of polytheism, the belief that there are more gods than one, is indicated, though only apparently, since the sun, moon, stars, hre, and the firmanent are spoken of as the manifestations and attributes of the

VEDDAS (věďdáz), or Veddahs, a native race of Ceylon, occupying the eastern part of the island. They are a remnant of a primitive type of mankind and are small in stature, rarely more than five feet two inches in height. The men are skilled archers and spend much of the time in hunting and fishing. Their dwellings are primitive and the government is patriarchal. This race differs from the Singhalese, who constitute the predominating people of Ceylon. Intercourse between the two is very limited. The Veddas number about 2,225.

VEDDER (věďděr), Elihu, painter, born in New York City, Feb. 26, 1836. After studying painting in New York, he studied successively at Paris and in Italy. Subsequently he settled in New York, where he applied for admission to the Union army in the Civil War, but was rejected because of a defect in the left arm. He returned to Europe in 1865 and in the same year was elected a member of the National Academy. His skill as a genre painter is of high repute. Among his best works are "Death of Abel," "Monk upon the Gloomy Path," "A Dancing Girl of Venice," "Lair of the Sea Serpent," and "Arab Listening to the Sphinx." Several of his works are in the Congressional Library at Washington, D. C.

VEDDER, Henry Clay, church historian, born at De Ruvter, N. Y., Feb. 26, 1853. After graduating at Rochester University, in 1873, he attended the Rochester Theological Seminary,

and in 1876 became associate editor of The Examiner. In 1892 he was chosen chief editor of that publication, and in 1894 was made church historian of the Crozer Theological Seminary at Chester, Pa. From 1885 until 1892 he was editor of the Baptist Quarterly Review, during which time that publication was greatly improved and its circulation was increased very materially. Among his books are "Decline of Infant Baptism," "Dawn of Christianity," "Baptists and Liberty of Conscience," "Decline of Apostolic Succession in the Church of England," "A History of the Baptists," and "A History of the Baptists in the Middle States."

VEGA CARPIO (vā'ga kar'pē-b), Lope Felix de, eminent poet, born in Madrid, Spain, Nov. 25, 1562; died there Aug. 26, 1635. His family name was Carpio, but the name Vega was taken from the estate of his father. He studied under the Iesuits in the imperial college of Madrid, where he acquired skill in grammar and rhetoric and gave evidence of having remarkable talent in writing and composition work. His first poem, "Arcadia," was written for a Spanish nobleman, to whom he became secretary after completing his studies. He joined the famous Spanish Armada for the conquest of England, but returned safely to Madrid in 1590, where he became a monk of the Order of Saint Francis and took priest's orders. No one ever stood higher in Spanish literature than he did about 1614, when he was in the height of his power as a writer of poetry and dramas. Pope Urban VIII. conferred the cross of the Order of Saint John of Jerusalem upon him, in 1637, and he was otherwise honored by princes and sovereigns. His versification is easy and graceful and his style is pleasing. He is the author of about 1,750 comedies and dramas, though only onefourth of them are extant. His most famous poem is the "Hermosura de Angelica," a production somewhat similar to Ariosto's "Orlando Furioso."

VEGETABLE (věj'ê-tà-b'l), a name used interchangeably with the word plant, but applied in a more restricted sense to any plant that is used as an article of food. The familiar vegetables include plants that are grown as food products for their various parts, such as the leaves, roots, flower buds, and fruit. Carrots and turnips are valuable for their roots, while onions are grown for their bulbs and cauliflower for its flower buds. Cabbage and lettuce are cultivated for their leaves; potatoes, for their tubers; and beets, both for their roots and leaves. Beans and peas are grown for their seeds, which are eaten green or mature, while corn as a vegetable is eaten in an unripe con-

Vegetables are important as food products for their starch, protein, and sugar, and the indigestible portions consist mainly of ash and fiber. The principal element is water, which is found in varying proportions, being about 58 per cent. in green beans and 95 per cent, in the cucumber, The watermelon contains less than one per cent. of protein, while others have a much larger quantity, being about 9 per cent. in the green

Most vegetables have a small per cent. of fat, though it rarely exceeds one per cent., and the quantity of ash is correspondingly small. Nitrogen constitutes four per cent. of the onion, nineteen per cent. of green corn, and twenty-six per cent. of the sweet potato. A mixed diet of vegetable and animal foods is usually recommended. Ordinarily the animal foods are consumed in larger quantities in cold countries, while the vegetable foods are used more extensively in the warmer zones.

VEGETARIANISM

(věj-ē-tā'rĭ-an-ĭz'm), the practice of living solely on vegetables, such as grain, fruit, pulse, and nuts. The term is used to describe both those subsisting with or without the addition of milk, butter, cheese, and eggs, but fish, fowl, and flesh are strictly excluded from the diet. The theory of vegetarianism is based upon the claim that man subsisted wholly on fruit in the period immediately following the creation, and that a vegetable diet tends to promote temperance and purity in thought and life. As a doctrine and practice it dates from the time of Pythagoras, who subsisted wholly on a vegetable diet. At present it is most strictly observed in India, where certain castes of the Hindus have practiced vegetarianism for ages. Vegetarians are opposed in their doctrine and practice by the physiologists, who generally admit that a theoretically perfect diet can be obtained from the vegetable kingdom, but hold that the stomach, teeth, and other organs are constructed in such a manner that a mixed died is preferable. Besides, they assume that it is impossible to ascertain the diet of the first man and point to the circumstance that hunting was a favorite occupation at a very early stage, thus leading to the conclusion that the diet consisted to a considerable extent or exclusively of flesh.

VEII (vē'yī), a rival city of ancient Rome, in Etruria. It is not definitely known where this city was situated, but most writers assume that it occupied the site of Isola Farnese, twelve miles from Rome. In the time of Romulus, the founder of Rome, a struggle for supremacy began between the two cities. The contest continued under all the Roman kings, except Numa, and the result was generally favorable to Rome, which was rapidly gaining in population and commercial importance. A siege of ten years at last resulted in the fall of Veii in 396 B. C. When the Gauls conquered Rome, an attempt was made to rebuild Veii and make it the capital, but it never attained material importance, though both Caesar and Augustus planted colonies on its site. Numerous remains of the Etrurians from Veii are preserved at Rome.

VEIN (vān), a membranous tube or canal

conveying blood to the heart, after it has been conducted from the heart through the arteries to the different parts of the body. The veins carry the dark or venous blood. As they do not receive the direct impulse of the heart, they differ from the arteries in their walls being much thinner and less elastic. They are usually nearer the surface than the arteries, some of them coursing along under the skin, as in the tack of the hand, where they may be seen. At their farthest extremity, where they are minute in size, they are formed by the venous capillaries, which receive the blood from the arterial capillaries, and they increase in size and diminish in number as they gradually pour into one another, forming the vena cava ascending and the vena cava descending, which discharge the blood into the right auricle. The vena cava ascending is a large vein through which the blood from the lower part of the body is returned to the heart, and the vena cava descending is a vein carrying the blood from the head and upper limbs to that organ. The veins form the so-called venous system. Each lobe of the lungs has a pulmonary vein by which the oxygenated blood is returned to the left side of the heart, after being received by them through the pulmonary artery. Among the diseases of the veins are phlebitis, an inflammation of their lining membrane, and varix, a dilatation of the vein structure, which is referred to or closely connected with varicose veins. The latter are veins in a state of permanent or abnormal dis-

VEIN, in geology, a narrow formation of igneous rock that occurs in vertical or inclined fissures, differing from the stratification in which it is found. The cause of veins may be assigned to heavy pressure upon molten rock, which is thus forced through openings in the crust of the earth. Veins that bear metal are usually termed *lodes*, which sometimes extend many hundreds of feet into the earth. Boulders frequently contain small veins. In a more general sense, the word vein is applied to a mineral formation that has a horizontal position, as a vein of lignite or bituminous coal.

VELASQUEZ (vå-las'kåth), Diego Rodriguez de Silva, eminent painter, born in Seville, Spain, in June, 1599; died in Madrid, Aug. 7, 1660. The date of his birth is not certain, but it is known that he was baptized on June 6, 1599. He descended from a noble family and was given the advantage of a good education. After studying art under Francisco Herrera the Elder, he became a pupil of Francisco Pacheco, and subsequently married Juana, the daughter of the latter. Philip IV. of Spain called him to Madrid in 1622 and appointed him imperial painter, and he remained the favorite painter of Spain until his death. He visited Italy in 1629 to study the works of Raphael, Titian, and Michael Angelo, but two years later returned to Spain. The king created him a

noble in 1658 and assigned him rooms in his palace, which he is said to have visited at numerous times to witness the work of the great artist while busily engaged. Velásquez ranks next to Murillo as the most eminent Spanish painter. His noteworthy paintings include "Adoration of the Magi," "Saint John in the Desert," "Brothers of Joseph," "Christ on the Cross," "Moses Taken from the Nile," and "Gardens of the Medici," a beautiful landscape painted at Rome. He executed famous portraits of Pope Innocent X. and of Philip IV.

VELOCIPEDE (ve-los'i-ped), the general name of any light vehicle that is propelled by the person or persons who ride upon it. The first vehicle of this kind was invented in 1817 at Mannheim, Germany, and was constructed chiefly of wood. It consisted of a wooden bar about five feet long and six inches wide, each end supported by a single wheel, and the rider sat astride on the bar and propelled the vehicle by the action of his feet upon the ground. While it did not come into general use, this machine was the forerunner of both the bicycle and the tricycle.

VELOCITY (vė-los'i-ty), a term used in mechanics to express the rate at which a body moves in space. It is said to be constant, or uniform, when the moving body passes over equal spaces in equal times, and it is termed variable velocity when the spaces passed over in equal times are unequal. Average velocity is the ratio of the whole distance passed over to the time required for such passage. Velocity is said to be retarded when a body passes through less space in each successive portion of time, and it is termed accelerated when the space passed over becomes greater during each preceding equal portion. Bodies whose movements through equal spaces are unequal at different periods are said to have a variable velocity. The velocity of a body is usually expressed at a given number of feet per second, or at so many miles per hour.

VELVET (věľvět), a familiar pile fabric, which is made by passing the warp over wires so as to form a row of loops that project from the backing, and, when the wire is withdrawn, form an uncut or piled velvet. To make cut pile, the name of a kind of velvet used most extensively, a knife is passed along the groove on the top of each wire to cut the pile before the wire is withdrawn. The loops thus cut form a covering resembling a very fine but short fur. Velvet of the best kind is made entirely of silk, but inferior grades are obtained by weaving silk so as to form a face on a cotton or partly woolen basis. Velveteen is a fabric made of a mixture of silk and cotton. A similar product made of silk and wool is known as plush. It is thought that velvet was first manufactured in China, where fine grades are still produced, and it is not known when the first products were made in Western Europe. Rich and artistic textiles were made in Italy as early as the 12th century, whence the manufacture of velvets gradually extended northward. The chief seats of modern manufacturers of velvet textiles are at present in Crefeld, Germany, and in Lyons, France.

VENABLE (věn'à-b'l), Charles Scott, educator and author, born in Prince Edward County, Virginia, April 19, 1827; died in 1903. After graduating from the University of Virginia, he studied at the German universities of Berlin and Bonn. In 1848 he was elected professor of mathematics at Hampden-Sydney College, where he remained about seven years, and in 1856 was teacher of physics and chemistry in the University of Georgia. He was made professor of mathematics and astronomy in the University of South Carolina in 1858, but resigned in 1861 to become lieutenant colonel on the staff of General Lee. In 1865 he was appointed professor of mathematics at the University of Virginia, which institution conferred a degree on him in 1868. His writings consist largely of school text-books in mathematics.

VENDETTA (věn-děťtá), the name applied to the practice of individuals taking private revenge upon their enemies, especially upon those who have murdered a relative. This practice originated in Corsica and the name is from the Latin word vindicta, meaning revenge. When a murder has been committed, the relatives of the murdered man as well as the officers pursue the guilty party, and he is slain without process of law as soon as he is apprehended. The practice exists at present to a limited extent among peoples who are not highly civilized, but it has been very largely suppressed in Italy and Corsica.

VENEERING (ve-ner'ing), the art of attaching thin layers of fine-grained wood to a less costly or ornamental material. The veneers are cut chiefly of such woods as mahogany, maple, and rosewood, and are commonly glued to the surface of fir or pine, thus giving the finished product the appearance of the more valuable material. Recent improvements in machinery have made it possible to prepare sheets as thin as paper, thus facilitating the economical use of the finer grades of woods. In fastening the veneers, the surface is roughened so as to take glue readily, and pressure is applied while drying. The surface is afterward polished and finished, as in dealing with other solid cabinet Veneering is employed principally in making the more costly furniture and musical instruments. Thin sheets of ivory and other substances are used in some kinds of veneering.

VENEZUELA (věn-ê-zwē'là), a republic in the northern part of South America, the third largest political division of that continent, being exceeded in size only by Argentina and Brazil. It is bounded on the north by the Caribbean Sea, east by the Atlantic and British Guiana, south by Brazil and Colombia, and west by Colombia. The length from northeast to southwest is 920 miles and the extent north and south is about 725 miles. It has an area of 593.943 square miles.

DESCRIPTION. Two chains of the Andes extend into the northern part from Colombia, the eastern branch of which is known as the Merida Mountains. These highlands attain elevations that range from 10,000 to 15,400 feet, while the western branch has summits from 2,500 to 4,000 feet above the sea. The southern section is traversed by two mountain chains, the Parima and the Pacaraima, the latter forming a large portion of the boundary between Venezuela on the north and Brazil and Guiana on the southeast. The vast interior comprises the larger part of the Orinoco basin, which is formed by a series of plains or llanos of great fertility and luxuriant vegetable growth. Here are fine forests of palms, mahogany, black and white ebony, satinwood, rosewood, cinchona or Peruvian bark, and trees that yield sarsaparilla and other drugs. Wild animal life is represented in large numbers in many sections of the country and includes the jaguar, tapir, alligator, puma, monkeys, aquatic fowls, and birds of song and plumage.

The drainage is chiefly by the Orinoco into the Atlantic. This stream forms the great outlet for Venezuela and the central part of Colombia. It receives the inflow from numerous tributaries, which include the Apure, Meta, Caura, Caroni, and Casiquiare. The last mentioned connects the Orinoco with the Negro River, a tributary of the Amazon. The Orinoco is navigable throughout the country and many of its tributaries furnish transportation facilities for large vessels. Three inlets of considerable size indent the northern shore, including the gulfs of Paria, Triste, and Venezuela. Lake Maracaibo, in the northwestern part, is the largest inland water.

Venezuela is located wholly in the Northern Hemisphere, but the climate is tropical and the seasons are distinguished as the wet and dry. The lowlands of the northeast and central parts are within the warm belt, but the heat is tempered by the trade winds from the Atlantic. Here the mean temperature varies from 75° to 90° and the low and marshy lands are sometimes subject to epidemics of yellow fever. The section of country that has an altitude above 2,250 feet is temperate and the climate is salubrious and delightful. In the highlands that lie above 6,500 feet above the sea the climate is colder and the line of perpetual snow begins at an altitude of 14,000 feet. All the higher altitudes have a healthful climate. Rainfall is ample in all parts of the country and in the lowlands it is frequently excessive, causing a large part of the country to be flooded.

MINING. The country possesses much mineral wealth, but mining has not been developed to any great extent. Salt is obtained in the Araya

peninsula, copper in the Aroa district, and iron, silver, copper, and granite are abundant in the mountains. Petroleum abounds in the states of Los Andes and Tachira. Largo la Brea, or the Lake of Pitch, is a remarkable basin and is about six miles long. It is situated near the Gulf of Paria, west of the island of Trinidad, and is famous for its extensive deposits of asphalt which is obtained in large quantities for street paving. Other minerals include coal, sulphur, tin, kaolin, and precious stones.

phur, tin, kaolin, and precious stones.

Agriculture. Farming is the chief industry, but not more than one-third of the area is productive. Coffee ranks as the leading product and is closely followed in the yield by cacao, sugar cane, and fruits. Tobacco thrives in the lowlands, where cotton and indigo yield good returns, but these products are not cultivated extensively. Other products include vanilla, tonka beans, and many varieties of fruits. Great herds of cattle and horses are reared on the llanos. The country has large interests in raising mules and sheep. Goats, swine, and poultry are grown to some extent. It may be said in general that the methods of farming are primitive and that the breeds of live stock are not of a high grade.

MANUFACTURES. The manufacturing enterprises have not assumed extensive proportions and the output is intended more largely for home consumption than for exportation. The

home consumption than for exportation. The fisheries yield good returns for canning and curing. Some advancement has been made in the manufacture of cheese and in canning fruits. Most of the establishments are in the larger cities, where cotton weaving, tanning, wool spinning, and the manufacture of boots and shoes are carried on successfully. Among the general manufactures are furniture, sugar, pipe tobacco and cigars, clothing, spirituous liquors, earthenware, and machinery. Much of the capital employed in both manufacturing and mining is furnished by foreigners.

COMMERCE AND TRANSPORTATION. The exports greatly exceed the imports. They consist chiefly of coffee, cacao, cattle, hides and skins, balata gum, copaiba, and gold. The imports include chemicals, cotton and woolen goods, ironware, hardware, and machinery. Foreign trade is principally with the United States, France, Great Britain, Germany, and the Netherlands. Much of the trade is in the hands of German, French, Italian, and Spanish inhabitants.

At present the country has only 850 miles of railroads, but transportation is facilitated by its seaboard on the Atlantic and the Orinoco and other rivers. Communication is facilitated by 5,500 miles of telegraph lines and 425 post offices. A French cable supplies the need of communication with Europe. Interior transportation is largely by packed mules and wagons. A number of canals have been constructed as a means of utilizing some of the rivers and Lake Maracaibo for navigation.

GOVERNMENT. Venezuela is a constitutional republic and the constitution was amended with the approval of the people in 1914. Executive power is exercised by a president, who is elected for a term of seven years. General legislative power is vested in the congress of two houses, the senate and the chamber of deputies. There are 40 members in the senate, two from each state. The deputies are elected by the states according to population. Both senators and deputies serve for terms of three years. The territories are under direct administration of the federal government. A national judiciary has jurisdiction to all cases relating to the nation and the territories. Each of the states has its own executive, legislative, and judicial officers. Local government is vested in subdistricts of the state and in the municipalities. The bolivar, valued at \$0.193, is the monetary standard.

EDUCATION. Attendance at school has been free and compulsory since 1870, but fully 75 per cent. of the adult population cannot read and write. Elementary schools are maintained in all the populated districts. Caracas is the seat of the national university, and five other institutions of higher learning are maintained in different parts of the country. It has four normal schools, twelve federal colleges, and a number of private and parochial schools. A national museum and library are maintained at Caracas, which has a collection of 40,000 volumes. Music, military science, fine arts, technics, and industry are taught in a number of institutions. Roman Catholicism is the state religion, but general toleration in matters of faith prevails, though most of the Protestants are foreigners.

INHABITANTS. A large majority of the people are an admixture of native whites and Negroes. The inhabitants of pure white blood are not numerous. Spanish is the official and spoken language. Caracas, on the Caribbean Sea, is the capital. Other cities include Maracaibo, Valencia, Barcelona, and Barquisimeto. In 1912 the population was reported at 2,691,636. This included 52,500 of foreign birth and 325,000 Indians.

HISTORY. Columbus discovered the coast of Venezuela in 1498. The region was visited the following year by Vespucci, who named it Venezuela, meaning Little Venice. Spaniards settled at Cumana in 1520 and it remained subject to Spain until 1811, when it declared its independence. Subsequently it again came under Spanish dominion, but in 1813 it united with Ecuador and New Granada to form the republic of Colombia. In 1830 the states again separated, but Spain did not recognize the independence of Venezuela until some years later. The country has undergone a number of revolutions and civil wars, the troubles of 1854 leading to the emancipation of the slaves. Great Britain attempted to absorb a part of its eastern territory in 1895 by annexing it to British Guiana, but that country consented to submit the question to inter3029

national arbitration on a demand made by President Cleveland.

A period of internal discord began at the close of 1897, when Ignacio Andrade was elected president. Threatened by a strong revolutionary party, the president fled and a provisional government was established, but hostilities continued until the early part of 1901, when Cipriano Castro was chosen chief executive. Another crisis was reached in 1902, when Great Britain and Germany blockaded some of the ports as a means of securing an adjustment of certain claims resulting from a violation of contracts with British and German citizens. The dispute was finally submitted for adjustment to the court of arbitration at The Hague. International disputes continued to agitate the country throughout the administration of Castro, including serious complications with the Netherlands in 1908. The president sailed to Europe in the later part of the year to undergo an operation in France, but in the meantime the people rose against him and he was deposed. Although he attempted to return early in 1909, he was not permitted to land in Venezuela. V. Marquez Bustillos was elected president in 1914.

VENICE (věn'is), a seaport city of northern Italy, on the northeastern shore of the Adriatic Sea, twenty miles east of Padua. It is situated on a number of islands in the Lagoon of Venice. a shallow sheet of water separated from the Gulf of Venice by a long sand bank, and is connected with the mainland by a railway viaduct about two miles long. The city is one of remarkable beauty, being built on 120 islands, and the different portions are connected by more than 400 bridges. The islands are only a few feet above the water and the buildings are mostly on piles constructed of stone. A great canal, the Canalazzo, divides the city into two parts. It is crossed by a number of magnificent bridges, of which the Rialto is the most beautiful, being provided with three apartments for passage and lined with decorated shops and counters. The streets of Venice are formed by the different canals, on which boats, called gondolas, carry the people, instead of carriages and street cars as in most cities.

Venice has an appearance of marvelous beauty at night, when the streets are beautifully lighted by gas and electricity, and the gondolas move about the canals in all directions. The piazza on the west side of Saint Mark Church is the most noted center of activity. In its vicinity may be seen large numbers of people pursuing business and amusements. Among the most noteworthy buildings is the Church of Saint Mark, built in 813, a fine structure in the Byzantine style with Gothic additions. Four bronze horses, most lifelike in appearance, stand over the door of the church. They were brought from Constantinople in 1205 and carried to Paris by Napoleon in 1797, but they were returned to Venice in 1815. Other beautiful buildings include the mint, numerous churches and schools. hospitals, asylums, and business houses and residences. It has manufactures of jewelry, velvets, silks, earthenware, sugar, laces, sailing vessels, clothing, dyes, glass, and machinery. The harbor is shallow but spacious. The city has a large export trade in rice, glass, colonial goods, and various manufactures.

Venice was founded in the 5th century by refugees, who sought safety on the islands at the mouth of the Brenta from hordes of invaders under Attila. For several centuries little progress was made, owing largely to the fact that the surrounding country had been devastated by successive incursions of the barbarians from the north, but material growth and development of its industries began in the 7th century. In 697 Pauluccio Anafesto became the first Doge or Duke of Venice. Bridges were soon constructed to unite the islands, thus giving the different groups of buildings the appearance of a united city, and a profitable trade was stimulated by the Crusades in the period from 1096 to 1271. This was due principally to the circumstance that the northern part of the Adriatic is nearest to the region from which the Christians came who participated in the Crusades. Besides, the inhabitants of the surrounding country were friendly to the enterprise undertaken by the Crusaders. Thus a number of sandy and barren islands became the seat of a remarkable commercial life and the center of great wealth and enterprise.

Having developed rapidly in population and commercial enterprises, Venice secured control of the surrounding territory of the mainland. Constantinople was conquered by the Venetians in 1204, and large accessions of territory were obtained at the final division of the Byzantine Empire. In the 15th century the population of Venice numbered about 200,000 and its commerce was the largest in Europe. Though assailed by the Turks in the 17th and 18th centuries, it was able to resist the Moslem fleets, but it suffered a considerable decline. In 1797 Napoleon took possession of the city and made it a part of Austria. The Treaty of Pressburg annexed Venice and the territory of Venetia to Italy in 1806, but it was transferred to Austria in 1814, of which it remained a part until 1866. In the latter year it was annexed to the kingdom of Italy. Population, 1916, 163,684.

VENICE, Gulf of, an extensive inlet of the Adriatic Sea, forming the southeastern boundary of Venetia, a province of northern Italy. The extent is about sixty miles, from the delta of the Po to the mouth of the Tagliamento, and east of it is the shallow Lagoon of Venice and numerous islands. The northern extension is known as the Gulf of Trieste. The rivers flowing into it include the Brenta, Adige, and Piave.

VENTRILOQUISM (věn-trĭl'ô-kwĭz'm), the art of speaking or producing tones in such a manner that the hearers are led to believe that

3030

the sounds come from a different source than from the person uttering them. It depends wholly upon practice and dexterity. The secret of the art is in taking a deep inspiration, allowing the breath to escape slowly when speaking, and controlling the exhalation with the muscles of the palate and the larynx. This can be done without materially moving the lips, and the operator completes the illusion by engaging the attention of the hearers by various sleight-ofhand performances. The art is of great antiquity, being mentioned by both Jewish and Greek writers. Zera Simon and Professor Wyman are two Americans who attained a wide reputation on account of their skill in ventriloguism.

VENUS (ve'nus), the most brilliant of all the planets. It is classed as one of the inferior planetary bodies, having its orbit between those of the earth and Mercury. The ancients called it Lucifer, or the Morning Star, when visible before sunrise, and Hesperus, or the Evening Star, when it shone in the evening after sunset. Its general appearance is the same as that of Mercury. The mean distance from the sun is about 67,212,000 miles. A complete revolution around the sun is made in 224.7 mean solar days; hence, the year is equal to about seven and one-half of our months. The diameter of Venus is estimated at 7,700 miles. While the density is about the same as that of the earth, the volume of the planet is about four-fifths as great. Venus being very much inclined from a perpendicular, the torrid and temperate zones overlap each other, the polar regions having at one solstice a frigid temperature and at the other a torrid. A complete revolution around the axis is made in about 23 hours and 21 minutes, the axis being inclined to the ecliptic at an angle of about 75°. Venus exhibits phases like the moon in the various positions relative to the earth and the sun, but it is not known to have a satellite. It is thought to have a dense, cloudy atmosphere, and not to be sensibly flattened at the poles. Both Venus and Mercury transit the face of the sun, but the former at longer intervals. However, its transits are much more important, owing to its position in the heavens being nearer to us. Herschel expressed the view that we never see the real body of the planet, but only its vapor-laden atmosphere. See Transit.

VENUS, in Roman legend, the goddess of beauty and love, identified with the Aphrodite of the Greeks, who is regarded the daughter of Zeus and Dione. It was supposed that she had sprung from the foam of the sea and that she first visited the island of Cythera, whence she proceeded to Cyprus. These two islands were her principal seats. Though sought by many of the gods, she chose to marry Vulcan, but her fidelity to her husband was questioned more or less, and her intrigues with Adonis were celebrated by Shakespeare and other classic poets.

The dove, sparrow, and swan were her favorite birds, and she held sacred the rose, apple, and myrtle. Her children included Aeneas, the Trojan hero, and Cupid, the god of love. In statuary she is represented with her son, Cupid, in a chariot drawn by doves, or by swans or sparrows. Annual festivals, called *Veneralia*, were held in her honor. Among the most famous statues of Venus are the "Venus of Milo," the "Venus of Onidus," and the "Venus of Capua."

VENUS'S FLOWER BASKET, the name of a vitreous sponge, so called from its beautiful form and appearance. Several species of these sponges are found in the warm seas of Asia, especially in the vicinity of the Philippines and the East Indies. The skeleton of these animals resembles spun glass in appearance and the patterns found are often remarkable.

VENUS'S FLYTRAP, a plant native to North America, found along the sandy shores of North Carolina and elsewhere. It belongs to the family of sundews and is so named from its



VENUS'S FLYTRAP.

peculiar leaves, the upper portion of which are provided with hairlike feelers that are extremely sensitive to the touch. When small insects come in contact with this traplike formation, it closes down upon them quickly and absorbs the soft parts as a food. The leaves appear to lose a part of their power to act in this way, though they sometimes serve to catch two or three insects.

VERA CRUZ (vā'ra kroos), a seaport city

of Mexico, on the Gulf of Mexico, 198 miles east of the capital, with which it is connected by railway. The streets are regularly platted and paved with stone. It has secure fortifications and on the island of San Juan de Ulua, a short distance from the shore, is a well-protected castle. Most of the buildings are low and variously painted, but there are several substantial structures, including the cathedral, numerous other churches, and the customhouse. The harbor is of little importance, the only landing place being an open roadstead between the city and the castle. Among the manufactures are tobacco products, clothing, cotton and woolen textiles, utensils, and machinery. It has electric and gas lighting, telephones, several parks, waterworks, and a tramway. Having a low site, the city is quite unhealthful. The imports consist principally of hardware, spirituous liquors, textiles, and machinery. Among the exports are sugar, leather, vanilla, cochineal, cereals, and live stock. Vera Cruz was founded by Cortez in 1520, but its growth dates from the 17th century. A French army captured the castle in 1838. It was likewise taken by General Scott in 1847. From 1862 to 1867 it was in possession of the allied army of France and Spain. Population, 1910, 29,164.

VERAGUA (và-rä'gwà), Don Christobal, Duke of, statesman, born in Madrid, Spain, in March, 1837. He descended from Christopher Columbus, being the thirteenth in descent from that noted explorer. After studying at the University of Madrid, he took a course in law, and in 1871 was elected to the Spanish Cortes. He was made a member of the municipal council of Madrid in 1874 and in the same year was reëlected to the Cortes. In 1878 he became a senator and served as minister of the interior and commissioner of agriculture. Three years later he was one of the presidents of the American congress at Madrid. The duke and duchess visited the United States in 1893, and on May 1 of that year attended the opening of the World's Columbian Exposition in Chicago.

VERB, a word which expresses action, being, or state of being, and which serves to denote the principal part of what is stated about the subject. With respect to their use, verbs are either copulative or active. A copulative verb asserts the predicate of a proposition, or of the subject, as in the sentence, "Iron is hard." Active verbs are divided into transitive and intransitive verbs. A transitive verb requires an object to complete its meaning, as "The scholar learned his lesson;" and an intransitive verb does not require such an object, as "The grass grows rapidly." Verbs are termed active or passive, depending upon whether the subject acts or is acted upon, and a third class is known as neuter verbs, which imply being or condition. Verbs, with respect to their form, are either regular or irregular. The properties of verbs are voice, mode, tense, number, and person.

Verbs which are used in the conjugation of other verbs are called *auxiliary* verbs. See Participle.

VERBENA (ver-be'na), a large genus of flowering plants of the vervain family. They have four-sided stems, opposite or alternate leaves, and flowers in racemes or terminal spikes. Seventy species have been described, most of which are native to America, and many are prized in cultivation. The nettle-leafed ver-



GARDEN VERBENA.

bena is three to six feet high. It has long spikes with small white flowers. Other species are the blue, garden, bracted, and Rocky Mountain verbenas. They take the form of herbs in temperate climates and grow as shrubs or trees in hot countries. All the species are easily hybridized. Several of these plants yield medicinal properties. The lemon grass, a species of verbena, yields the oil of verbena.

VERDI (ver'de), Giuseppe, operatic composer, born in the duchy of Parma, Italy, Oct. 9, 1814; died Jan. 27, 1901. He was the son of an inn-keeper of limited means and was unable to take advanced musical instruction until assisted by a rich friend, who supplied the means necessary to enable him to study in Busseto and Milan. He was organist at Roncole, his native town, when he was only ten years old. In 1842 he became famous by publishing a drama entitled "Oberto di San Bonifazio," and soon after produced many beautiful operas. His most noted productions include "Otello," "Montezuma," "Requiem," "Aida," "Il Trovatore," and "Falstaff." The last mentioned is his final production, which was published in 1893.

VERDUN, a fortified city of France, on the Meuse River, 43 miles west of Metz. The features include the cathedral, the public library, and a chain of strong forts. It was ceded by Germany to France in 1552. The Germans captured it in 1870. In 1915 and 1916 it was the scene of severe bombardments by the Germans. Population, 1914, 23,876.

VERESHTCHAGIN (vyĕ-rĕ-shchä'gĭn), Vasili, eminent painter, born in the government of Novgorod, Russia, Oct. 26, 1842; died April 13, 1904. He studied in Russia and later became a pupil of Gerome at Paris. He enlisted for military service in the Turcoman campaigns in 1867, and later served in the Russo-Turkish War of 1877. Subsequently he visited Syria, Persia, and many parts of India, turning his travels to good account in various paintings. The Russian authorities employed him to paint a number of scenes in connection with the execution of nihilists. At the time of the Spanish-American War he visited Cuba, He painted many scenes in the Russo-Japanese War and lost his life when the Petropavlovsk sunk at Port Arthur. Among his leading works are "The Road After Plevna," "Long Forgotten," "The Emir of Samarkand," and "The Pyramid of Skulls."

VERGA (věr'gà), Giovanni, novelist and dramatist, born in Catania, Sicily, in 1840. He removed to Italy at an early age, where he studied for a literary career and lived most of the time at Florence and Milan. In 1865 he published three novels, but his reputation was established in 1880 when he completed "Eva," which gives evidence of deep insight into psychological studies. His writings have often been compared with those of Zola. Among his best known works are "Medda," "La lupa," "Eros," "I Vinti," "Vita dei campi," "Il marito di Elena," and "Maestro Don Gesualdo."

VERGIL. See Virgil, Publius Virgilius

Maro.

VERLAINE (var-lan'), Paul, poet, born at Metz, Germany, March 30, 1844; died Jan. 8, He belonged to a French family and studied chiefly in Paris. In 1881 he made an extensive tour through England and many countries of the continent, but resided in Paris until his death. His life was spent largely among people who are fond of entertainment and drinking, and part of his time was passed in the hospital or in prison. His writings are not numerous, though they rank among the foremost poems of France. Some of his productions deal with religious mysticism and all of them snow many variations in the style of treatment.

VERMEJO (var-ma'ho), a river in South America, which rises in the Andes Mountains of Bolivia, and, after a general course of about 800 miles toward the southeast, enters the Paraguay about forty miles north of Corrientes. A large part of the middle course is through a swampy region, in which the channel is wide and shallow. The valley of the Vermejo is fertile and heavily timbered.

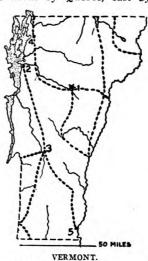
VERMES, or Worms. See Worms.

VERMIFORM APPENDIX (ver'mi-form ăp-pěn'diks), a long and slender process of the caecum in man and some other animals, so called from its resembling a worm in form. This organ is situated in the right side of the lower abdomen, is from three to six inches long, and in most cases projects upward and inward. function probably is unimportant, since the organ can be removed without impairing the system. In structure the vermiform appendix resembles the large intestine. See Appendicitis.

VERMILION (ver-mil'yun), a brilliant and durable pigment of a scarlet color. It is obtained from a mineral ore called cinnabar, or is produced artificially by grinding a mixture of mercury and sulphur for several hours and then digesting the black product with potassium hydroxide until the desired color is obtained. The ore cinnabar is of a blood-red color, and vermilion is obtained by grinding the product into a fine powder. Important mines of cinnabar are worked in California, Brazil, Spain, Austria, China, and many other countries. The cinnabar mines of Almaden, Spain, are the most famous and have been in successful operation for thirty centuries.

VERMONT (ver-mont'), a State of the United States, one of the New England group, popularly called the Green Mountain State. It is bounded on the north by Quebec, east by

New Hampshire, south by Massachusetts, and west by New York. Lake Champlain forms more than half of the western boundary, and all of the eastern border is formed by the Connecticut River. Most of the islands in Lake Champlain belong to Vermont, including Grand and La Motte islands. The length from north to south is 158 miles and the width at the northern boundary is 90 miles,



1, Montpelier; 2 Burlington; 3, Rutland; 4, Saint Albans; 5, Brattle-boro. Principal railroads are shown by dotted lines.

but it gradually narrows to 40 miles at the southern extremity. The area is 9,565 square miles, including 430 square miles of water surface.

DESCRIPTION. Much of the surface is mountainous. The State is divided into two nearly equal parts by the Green Mountains, which trend north and south, and in the northern part a second range branches off toward the northeast. Ranges of hills traverse the State in various directions, but no part of it is greatly elevated, and the general altitude ranges between 500 and 1,000 feet. Mount Mansfield, the highest peak, has an elevation of 4,390 feet. The lowest land is in the vicinity of Lake Champlain, where the altitude is about 100 feet above sea level. Fine forests are abundant, even to the summits of the highest mountains.

The drainage is largely into the Connecticut, which separates the State from New Hampshire, and into Lake Champlain, a fine body of fresh water forming a large part of the boundary between Vermont and New York. Among the chief streams within the State are the West and the White, flowing into the Connecticut; and the Missisquoi, the Lamoille, the Winooski, the Otter, and the Poultney, flowing into Lake Champlain. The southwestern part is drained into the Hudson River by several small streams and the Black River in the north drains into Lake Memphremagog, which forms part of the Canadian border. Small lakes are found in many parts of the mountainous sections.

The climate is marked by sudden and extreme changes and a large amount of snow falls in the winter. All seasons of the year are bracing and healthful. The climate is milder in the vicinity of Lake Champlain than in the more elevated parts of the State, but that body of water is frozen over a part of the winter. In summer the temperature ranges from 60° to 92° and in winter from 10° to 45°. The extremes are 30° below zero in winter and a summer heat of 98°. All parts of the State have adequate moisture, with a rainfall of 32 inches in the south and 40 inches in the north.

MINING. Granite is the chief mineral product, but the State has deposits of copper, lead, slate, and small quantities of gold and silver. Marble of a fine grade is quarried at Proctor and the quality, both in whiteness and durability, is in competition with the marble of Carrara, Italy. Large quantities are obtained for construction and monumental purposes. Copper is mined in the eastern part of the State, in the vicinity of Ely. Slate is quarried chiefly in Rutland County and Barre is celebrated as the center of large quarries that produce a fine grade of gray granite. Clays of a superior quality are abundant. Other minerals include manganese, iron, asbestos, and soapstone.

AGRICULTURE. About 80 per cent. of the area is included in farms, which average 142 acres. The largest portion is devoted to the cultivation of hay and forage, about 1,050,000 acres. The acreage of these products greatly exceeds that of all other crops combined. The leading cereals include oats, corn, barley, buckwheat, and rye. Farming is generally conducted with great care so as to utilize the soil to the best advantage. Commercial fertilizers are employed to a considerable extent to enrich the land and modern machinery is used generally upon the farms.

Dairy farming is especially noteworthy and more than half the cattle are dairy cows. Butter and cheese of a fine quality are produced, and the product is shipped largely to markets in Boston and other commercial centers of the East. Horses of good breeds are grown for the market, but the number of heads is much less than that of cattle. Other domestic animals include sheep, swine, mules, and poultry. Both farming and the animal industry are diversified in every part of the State, and nearly all of the farms have a variety of domestic animals and a varied line of crops.

MANUFACTURE. Butter, condensed milk, and cheese together represent the most important manufacture, when considered from the standpoint of value for the past several years. Lumber and timber products usually rank second, but in value are nearly equaled by the output of marble and stone works. Other lines of manufacture include monuments and tombstones, paper and wood pulp, flour and grist mill products, cotton and woolen textiles, hosiery and knit goods, and foundry and machine shop The general manufactures include products. cigars, hardware, furniture, sugar, and farming machinery. Many of the mountain streams furnish power for operating machinery, especially such as is usually run by electricity.

Transportation. The State has 1,125 miles of railroads. The principal lines include those of the Boston and Maine, the Grand Trunk, and the Central Vermont. Additional transportation facilities are furnished by the Connecticut River and Lake Champlain. Numerous electric lines are operated in the cities and some of the rural districts. The highways are usually in a

good state of repair.

GOVERNMENT. The present constitution was adopted in 1793, but it has been amended several times by conventions and by the people. Executive authority is vested in the governor, lieutenant governor, secretary of State, treasurer, and auditor of accounts, each elected by the people for two years. The Legislature is constituted of the senate with 30 members and the house of representatives with 246 members. Each town and city within the State has a representative in the lower house, while representation in the senate is based upon districts according to population. The members of both branches are elected every two years. A supreme court of seven judges is at the head of the judicial system, which includes courts in each county and justices of the peace in the towns. Each probate district has a probate court. Local government is administered by the counties, municipalities, and towns.

EDUCATION. State aid is given to maintain the public schools, but local funds and taxes are the chief means that are utilized to support the educational work. Many of the schools in rural districts have been combined and pupils are transported to centrally located buildings. In 1906 the Legislature enacted several measures which are important to the general advancement in educational work. These measures include a system of district supervision, which is now in successful operation and has been the means of stimulating interest in educational work among the pupils and teachers. Under these laws much has been done to classify and

broaden the work in the high schools throughout the towns and cities of the State.

Three public normal schools are maintained, at Castleton, Johnson and Randolph, but additional normal training is given in several high schools and colleges. Foremost among the higher institutions is the University of Vermont, which is located at Burlington. The Middlebury College is located at Middlebury; the Norwich University, at Norwich; the Home for Friendless Boys, at Westminster; the Vermont Academy, at Saxton's River; the Brigham Academy, at Bakersfield; and the Goddard Seminary, at Barre. Waterbury and Brattleboro have hospitals for the insane. Windsor is the seat of the State prison, Rutland has a house of correction, and Vergennes has an industrial school. A home for disabled soldiers is maintained at Bennington.

INHABITANTS. The State has the smallest per cent. of urban population among the North Atlantic states. However, it has no large cities, although it is important as a manufacturing State. The inhabitants consist chiefly of people who are of British descent. In 1900 they included 44,747 foreigners, of whom 25,540 were Canadians. All the leading religious denominations are represented. In numerical order they take rank as follows: Methodists, Congregationalists, Baptists, Roman Catholics, and Episcopalians. Montpelier, on the Winooski River, is the capital. Other cities include Burlington, Rutland, Saint Albans, Brattleboro, Barre, Saint Johnsbury, and Bennington. Population, 1900, 343,641; in 1910, 355,956.

HISTORY. The region included in Vermont was first visited in 1609 by Samuel Champlain, who explored the lake bearing his name. In 1761 the first settlement was made at Bennington. The district was claimed by both New York and New Hampshire and the governors of both states granted title to the same lands, thus causing a conflict of titles. New York obtained a decision of the king favorable to its claims in 1764, but the people of Vermont re-They organized militia and remained independent by making a military defense. Ethan Allen and Seth Warner became the leaders of a company known as the Green Mountain Boys, and with them the claims of New York were resisted until 1789, when that State recognized the independence of Vermont. It was admitted as a State on March 4, 1791, New York receiving at that time \$30,000 for its claims. The admission of Vermont was the first to take place after the thirteen original states had been formed into a constitutional Union. Vermont was a battle ground in the Revolution. The battles of Crown Point, Ticonderoga, and Bennington engaged many of its citizens.

Vermont was more democratic than any other New England State in the early history, having comparatively few wealthy people. The university was founded in 1791 and schools became generally established soon after. Montpelier was located in the central part in 1808. Saint Albans was a base of operations in the Fenian operations of 1866 and 1870. Although the State adopted constitutional prohibition of the liquor traffic in 1852, this measure was repealed in 1902 and a local option law was enacted the following year. In 1908 the Legislature established district supervision for the public schools and several other measures in the interest of education.

VERMONT, University of, a coeducational institution of higher learning at Burlington, Vt. It was founded in 1791 and the Vermont Agricultural College was incorporated with it in 1865. The first class graduated from it in 1804. The departments include those of liberal arts, sciences, commerce and economics, medicine, and mechanical and electrical engineering. Entrance is based upon examination or certificates issued by accredited schools. The University library contains 97,500 volumes. It has a faculty of 107 instructors and professors and an attendance of 700 students.

VERNE (vârn), Jules, eminent author, born in Nantes, France, Feb. 8, 1828; died at Amiens, France, March 24, 1905. After studying in his

native city, he took a course in law at Paris. He published his first writings for the stage in 1850, but his success dates from 1863, when he began to write his remarkably popular series o f The stories. first of these



JULES VERNE.

writings is entitled "Five Weeks in a Balloon," a work remarkable for its combination of imaginative power and scientific knowledge. Others along the same or similar lines soon followed. Many of his writings have been translated into the English, German, Spanish, and other languages. His best known works include "A Trip to the Center of the Earth," "Twenty Thousand Leagues Under the Sea," "Around the World in Eighty Days," "From the Earth to the Moon," "Across Africa in a Balloon," "Adventures of Captain Hatteras," "The Mysterious Island," "A Nephew from America," and "Christopher Columbus."

"Christopher Columbus."

VERNET (var-na'), Claude Joseph, famous painter, born in Avignon, France, Aug. 14, 1714; died in Paris, Dec. 3, 1789. He was first instructed in painting by his father, Antoine Vernet, and in 1732 went to Italy, where he re-

3035 VERONA

mained twenty years. His works at Rome were largely scenes of seaports, storms, moonlights, and other sea views. He was recalled to Paris in 1753 to paint the seaports of France, and was shortly after made a member of the French Academy. The fifteen paintings made by him of seaports of France are works of remarkable beauty and may still be seen in the Louvre. Many of his works have been engraved.

VERNET, Jean Émile Horace, eminent painter, born in Paris, France, June 30, 1789; died there Jan. 17, 1863. He was a son of Antoine C. Vernet (1758-1836), also a painter, and a grandson of Claude Joseph Vernet. The Revolution made it impossible for him to secure a good general education, but his genius in painting was developed at an early age under the personal supervision of his father. He finished his famous painting, "Taking of an Entrenched Camp," when twenty years of age. His works are numerous and are noted for realistic treatment of the subject rather than the classical, thus distinguishing them from those of Jacques Louis David (1748-1825) and other French painters. Vernet enriched his mind by traveling extensively in Southern Europe and Western Asia. He spent some time in Rome under the patronage of Louis Philippe, who had commissioned him to paint a number of war scenes relating to the conquest of Algeria. He made a tour of Egypt in 1840 and in 1842 visited Saint Petersburg, whence he went with Czar Nicholas to Sebastopol. In 1853 he accompanied the French army to Varna to witness several battles. His fame rests on a large number of paintings of battles and genre pictures, many of them in connection with the wars of Napoleon. Among his best known paintings are "The Battle of Wagram," "Dog of the Regiment," "Barrier of Clichy," "Soldier of Waterloo," "Battle of the Alma," "The Capture of the Smala," and "Battle of Jena."

VERNIER (vēr'nī-ēr), a contrivance for subdividing the divisions of graduated arcs or scales into minute parts, so named from Peter Vernier of Brussels, who invented it in 1631. The apparatus consists of two scales, one movable and sliding along the side of the other, which is fixed. On the movable scale are ten divisions, which are equal to either 9 or 11 divisions of the fixed scale. In the one case they are numbered from 0 to 10 forward, or in the same direction with the numbering of the fixed scale, while in the other case the reading of the vernier scale is backward, or in the opposite direction from that of the fixed scale. The scale of inches divided into tenths will exemplify the use of the vernier in obtaining readings of tenths of these subdivisions, or of hundredths of inches. In the case of the vernier scale of 10 parts, equal to nine-tenths of an inch, it is obvious that the moving of the vernier one-tenth of one of the divisions of the fixed scale will bring the division of the vernier marked 1 into coincidence with a line of the fixed scale, and similar combinations are made by the multitude of movements that are possible. Two or three verniers, usually arranged at equal divisions of the circle, are attached to many astronomical and geodetical instruments.

VERNON (vēr'nun), Edward, noted admiral, born in Westminster, England, Nov. 12, 1684; died in Suffolk, Oct. 29, 1757. He was the son of James Vernon, who was Secretary of State from 1697 to 1700. Young Vernon entered the navy at the age of sixteen years. In 1704 he witnessed the capture of Gibraltar and took part in other battles in the Mediterranean, and in 1708 sailed to the West Indies as rear admiral. He captured the Spanish city of Porto Bello, in Panama, in 1739, with the loss of only seven men. In 1741 he became a member of Parliament and in the same year was given command of a large fleet to attack Cartagena, Colombia, but was defeated with severe loss and compelled to retire to Jamaica. When Prince Charles, the pretender, threatened London, Vernon was given command of the fleet to guard the coasts of Sussex and Kent, but soon after entered into a quarrel with his officers and his name was stricken off the list. Lawrence Washington, eldest brother of George Washington, accompanied Admiral Vernon on his expedition against Cartagena, and it is due to this circumstance that his home on the Potomac was named Mount Vernon.

VERONA (ve-ro'na), a city of northern Italy, in the province of Venetia, 68 miles west of Venice. It occupies a fine site on the Adige River, near the Tyrolese Alps. The surrounding country is noted for its rich landscape scenery and general fertility, producing cereals, silk, and fruits. A line of substantial walls surrounds the city. These walls were begun by Emperor Gallienus, in 265 A. D., and were completed by Charlemagne. It has modern fortification outside the old walls, the whole works of defense making the place one of the most strongly defended in Southern Europe. Verona is the center of a large trade and has extensive interests in manufacturing enterprises. the converging center of a number of important railroad lines. Among the manufactures are cotton and silk textiles, woolen goods, hosiery, hats, pottery, jewelry, earthenware, and machinery. Fruit and stock culture are important industries in the surrounding country. Large quantities of wine and preserved fruits are produced in the vicinity. It has an important trade in cereals, sausages, cattle, and dairy products.

Verona has many beautiful buildings, among them the Scaligeri Palace, dating from 1370, a fine cathedral consecrated by Urban III. in 1187, and palaces built by the Pompei and Canossa families. It has the arena dating from the reign of Diocletian. The history of the city dates from the time of the Romans, under

whom it became a prosperous commercial center. Constantine captured it in 312, Theodoric in 489, and Charlemagne in 774. Its subsequent history is that of northern Italy, passing to the kingdom of Italy in 1866. Within recent years a number of substantial improvements have been made, such as the construction of electric lighting and rapid transit, the building of macadam and asphalt pavements, and the extensions of the gardens, parks, and public thoroughfares. Population, 1916, 86,128.

VERONESE (vå-rô-nå'zå), Paul, the popular name of Paolo Cagliari, a famous painter, born in Verona, Italy, in 1528; died in Venice, April 20, 1588. He was the son of Gabriele Cagliari, a sculptor, who taught the son the arts of his own profession. His natural taste for painting caused him to be placed under his uncle, Antonio Badile, under whom he rapidly developed skill as a biblical and historical painter. He painted successively in several Italian cities, including Rome and Venice, but made the latter his chief residence. Among his most noted paintings are his "Martyrdom of Saint Sebastian" and "The Baptism of Christ," both in the Church of Saint Sebastian at Venice. These and others of his paintings show great excellence in coloring and fertility of imagination.

Veronese was a contemporary of Titian and Tintoretto, with whom he ranks in the number and beauty of his productions, and he may be regarded one of the greatest painters of the Venetian school. His famous works include "Marriage at Cana," "Rape of Europa," "Venice, Queen of the Sea," "Banquet in the House of Simon the Pharisee," "Calling of Saint Andrew to the Apostleship," "Consecration of Saint Nicholas and Saint Helena," "Family of Darius at the Feet of Alexander," and "Vision of the Invention of the Cross." He painted a number of portraits and heads, this collection including about 120. Among them are those of Queen Eleanor of France, Charles V., Sultan Solyman I., Queen Mary of England, Titian, Tintoretto, and Vittoria Colonna.

VERONICA (vė-rŏn'ī-kà), Saint, a female saint connected by tradition with the passage of Christ to Calvary. It is thought that she was a native of Jerusalem. At the time Christ was bearing the cross to Golgotha she met our Savior, on whose brow she observed the sweat occasioned by the weight of the cross, and gave him her veil to remove the perspiration. As Christ removed the sweat from his brow, his divine features were miraculously marked upon the veil, with which Veronica is said to have converted Emperor Tiberius of Rome to the view that Christ is divine. The veil is still preserved by the canons of Saint Peter's in Rome.

VERRAZANO (věr-rát-sa'nō), Giovanni, navigator and explorer, born in Florence, Italy, about 1480; died at Calmenar, Spain, in 1527. He became a navigator at an early age and in

1522 captured a cargo valued at \$1,500,000, which Cortez had sent from Mexico to Charles V. of Spain. In 1524 he landed at Cape Fear, North Carolina, and thence sailed northward to Portsmouth, N. H. He returned to Europe in 1526, where he secured aid from France in making a second voyage to America, but was captured by the Spanish and taken to Spain, where he was executed by the order of the emperor. Several letters were published in 1524 in which an account was given of the voyages of Verrazano and his explorations of the Atlantic coast of North America from 34° to 50°.

VERRES (věr'rēz), Roman governor of Sicily, born in 112; died in 43 B. c. He was appointed quaestor in Cisalpine Gaul in 82 B. C., two years later served in the army of Asia, and shortly after was made governor of Sicily. His government in the rich island province is famous for the greed and cruelty with which he enriched himself and impoverished the people. The Sicilians at last tired of his tyranny and brought him to Rome for trial in 70 B. c., where he was defended by Hortensius and accused by Cicero. The orations of Cicero against Verres were so powerful and convincing that the latter fled to Marseilles (Massilia), where he lived in exile for 27 years. Though having an abundance of means to enjoy life, his riches at length caused Antony to crave his possessions and finally to put him to death by proscription.

VERRILL (věr'rĭl), Addison Emery, zoölogist, born at Greenwood, Me., Feb. 9, 1839. He graduated at the Lawrence Scientific School, Harvard University, in 1862, and was made professor of zoölogy at Yale in 1864. From 1867 to 1870 he was professor in the University of Wisconsin. He gave special attention to marine zoölogy, investigated the invertebrate fauna of the Atlantic coast, and published much of value regarding mollusks, polyps, and the squids of the North Atlantic. Subsequently he investigated the geology of the marine animals of the Bermuda Islands and made a fine collection of specimens, which were placed in the Peabody museum of Yale University. Among his chief publications are "Revision of the Polypi of the Eastern Coast of the United States," "Report upon the Invertebrate Animals of Vineyard Sound," and "Cephalopods of the Northeastern Coast of America."

VERSAILLES (ver-salz'), a city in France, capital of the department of Seine-et-Oise, ten miles southwest of Paris, with which it is connected by railway. Tourists regard it one of the handsomest cities of Europe, having long and straight streets, beautiful gardens and parks, and many fine adornments. It is noted rather for its pleasure than industry. The fine improvements and beautiful situation have caused it to be made the residence of many foreigners. The city has few manufactures and little more than local trade. It may be said that Versailles

dates from the time of Louis XIII., who maintained a country villa here, which he made his residence while hunting and rusticating. Louis XIV. spent large sums of money in building the Palace of Versailles and in embellishing the city. Later he made it the permanent seat of his court. Interior alterations and decorations were made by Louis XV., who spent large sums of money to beautify the palace, and the city continued to be a court residence down to the Revolution of 1789. The palace was converted by Louis Philippe into a museum, in which form it still exists. The palace is 1,400 feet long and is decorated within and without by beautiful forms of architecture. In the museum are collections of paintings and statues from the time of Clovis to the present. Among the most imposing paintings are those of Horace Vernet, illustrating the career of Napoleon.

Versailles was made the headquarters of the German army in October, 1870, and in its palace King William I. was proclaimed emperor of Germany in 1871. It was the seat of the French government from 1871 to 1879 and the headquarters of the army during the Commune. The Treaty of Versailles, signed in 1783, recognized the independence of the United States. In visiting France it is very desirable to witness the beauty of Versailles. Among the prominent features are some of the largest and finest fountains in the world, grand statuary, beautiful monuments, and costly paintings. In the vicinity are extensive orchards, orange groves, and gardens of flowers. The water supply is carried by a canal 200 feet ide and a mile long. This canal is lined on both sides by avenues of beautiful trees. The construction of electric lights and street railways has added much to the beauty and convenience of the city. Population, 1916, 64,820.

VERSE, a line of poetry, consisting of a certain number of accented and unaccented syllables. The ancients established thirty short syllables as the maximum length of the verse and counted a long syllable equal to two short ones. However, in lyric poetry the verse often exceeded this length. In modern poetry each verse is marked theoretically by one chiet stress and a slight pause is regularly assigned at the end. Lines that do not end in rhymes constitute blank verse. In poular use the word verse is often used instead of stanza. Poetry in a collective sense is frequently referred to as verse.

VERTEBRATA (ver-te-bra'ta), the highest branch of the animal kingdom, so named from having numerous joints in the spine, or backbone. Animals that belong to this division have jaws that move vertically and not laterally. The skeleton has many bones with ends suitable for jointed limbs. The brain is inclosed within a skull, which gives form and protection to the organs of hearing, sight, smell, and taste. With

the brain is connected a nerve tube, known as the spinal cord, which passes through the spine, and from it run series of nerves to the skin, muscles, and other organs of the body. The lungs, heart, and stomach as well as other important organs are in the upper part of the thorax, which is formed by the sternum, the ribs, the diaphragm, and the portion of the spinal column to which the ribs are attached.

Vertebrates have a complicated digestive system, which is divided into the oesophagus, small intestine, liver and pancreas, and large intestine. Various glands secrete fluids that are essential in the process of digestion. Respiration is facilitated by lungs in animals that breathe air and through gills in the water-breathing types. Circulation of the blood is carried on by means of the heart, arteries, veins, and capillaries, and the blood is red through the presence of red blood corpuscles. The body is protected by the skin and double protection is furnished in many cases by hair, scales, and feathers. In vertebrates the sexes are usually separate.

VERTIGO (ver'ti-go), or Dizziness, a symptom of some forms of cerebral disturbances, usually attended with obscurity of vision and disordered movements. The effect is that the intelligence is not able to correct the erroneous suggestions of the senses. Vertigo may arise from the presence of too much or too little blood in the brain, or from the effect of poisons upon the circulation. Sometimes it results from objects passing swiftly across the field of vision, as water falling rapidly from a great height, or by ascending to unaccustomed heights. Persons who are subject to epilepsy and paralysis have frequent attacks of vertigo. It usually acts as a symptom of the approach of an attack in these diseases.

VERTUMNUS (vēr-tǔm'nŭs), a divinity of ancient Rome, worshipped as the deity who presided over changes and transformations, especially the blooming and bearing of trees and other plants. It was possible for him to assume any shape he pleased. He fell in love with Pomona, the goddess of the fruit of trees, who became his wife. Gardeners offered garlands and buds to him on the 23d of August.

VERVIERS (var-vya'), a city of Belgium, in the province of Liége, fifteen miles southeast of Liége. It is finely located on the Vesdre River and has good railroad facilities. The noteworthy buildings include the Church of Saint Remacle, the public library, the city hall, and the central railroad station. Verviers is noted for its extensive manufacture of cloth, the annual product of which has a value of \$15,500,000. Other manufactures include confectionery, machinery, soap, leather, chemicals, ironware, dyes, and clothing. It is a modern city, having well-platted streets, substantial pavements, gas and electric lighting, and an extensive system of rapid transit. Formerly it was strongly defended by stone works, but its

fortifications were destroyed by Louis XIV. of France. Population, 1916, 48,735.

VESPASIAN (ves-pā'zhī-an), Titus Flavius, Emperor of Rome, born in the Sabine town of Reate, Nov. 17, in the year 9 A. D.; died there June 24, 79. He was of common birth and was the first plebeian to attain the throne of Rome. After serving with the army in Thrace, he was made quaestor in Crete and Cyrene, and rapidly rose to the offices of aedile and praetor. He served in Germany from 43 to 44 and in the reign of Claudius had command of a legion in Britain. Soon after he was sent as governor to Africa, where his reign is described as honorable and upright. In 67 he was appointed to conduct the war in Judaea, where he became highly distinguished by his military successes. While in Caesarea in 69 he was proclaimed emperor, first by an army in Egypt and later by his troops in Judaea. Vitellius claimed succession to the throne after the death of Nero and was supported by the Roman troops in Gaul and Germany, but the eastern army was unanimous in declaring for Vespasian and soon defeated Vitellius and captured Rome. Vespasian entered the capital in 70, where he was hailed by the people and recognized as emperor by the senate.

Vespasian had married the daughter of Flavia Domitilla, a Roman knight, by whom he had two sons, Titus and Domitian. Titus was placed in command of the army in Judaea and soon ended the Jewish War by capturing Jerusalem, thus restoring peace in the Roman world in the first year of Vespasian's reign. The succeeding nine years of his government are memorable for the peace that Rome enjoyed, the peace of Vespasian passing into history as a proverbial phrase. Once firmly established on the throne, he restored the capitol, which had been burned when Rome was taken ly his army. He reorganized the army, reformed the civil service, constructed public baths and a new Forum, built the Temple of Peace, and began the Colosseum. No Roman sovereign ranks higher as a friend to the common people and a ruler mindful of justice and economy in the administration of government. He encouraged artists and men of letters, granting Quintilian and a number of others a handsome pension. It is said of him that he liked a joke, was simple in his mode of life, and was easily approached in conversation. He was succeeded as sovereign by his sons, Titus and Domitian.

VESPUCCI (ves-poot'che), Amerigo, astronomer and navigator, born in Florence, Italy, March 9, 1451; died in Seville, Spain, Feb. 22, 1512. He was educated under the patronage of his uncle, a scholarly Dominican and a friend of Savonarola. His preference as a student was for philosophy, geography, and astronomy. After finishing his studies at school, he became a clerk in the commercial house of

the Medici, then the ruling family of Florence. In 1490 he accompanied Lorenzo de' Medici to Spain on a commercial enterprise, which country he visited at numerous times, and on May

10, 1497, sailed from Cadiz on an expedition to America. The tour was designed more particularly for astronomical research than geographical discovery, but the enterprise was fruitful in both lines. After cruising on the shores of the Canary Islands, the expedition of four



AMERIGO VESPUCCI.

vessels crossed the Atlantic in 27 days and reached the Bay of Campeachy, the southern extension of the Gulf of Mexico. The expedition next doubled Cape Sable and cruised along the Atlantic coast of North America to Cape Hatteras, whence it returned to Spain in 1498. Vespucci made a second voyage to America in 1499, when he cruised along the coast of Brazil from Cape Saint Roque to Lake Maracaibo, and thence sailed to the island of San Domingo. In 1501 he sailed under Dom Emanuel of Portugal and explored the coast of South America from Cape Saint Roque to the Bay of Rio Janeiro.

Vespucci sailed with an expedition for Malacca in 1503 under the Portuguese, but his ship became separated from the others and sailed to Brazil, reaching the Bay of All Saints. He sailed southward from the vicinity of Bahia and explored the coast of Cape Frio, where he built a fort. In 1504 he returned to Lisbon, Portugal, and the following year entered the Spanish service, with his seat at Seville. The remainder of his life was devoted largely to writing accounts of his various journeys, and preparing maps of his routes and explorations. Only a few of his writings are extant, most of our sources of information being from quotations and allusions to his works. It is quite certain that he reached the mainland of America in 1497, eighteen days before Cabot. A book published in 1507 by a geographer named Waldseemüller at Freiburg, Germany, contains numerous allusions to the discoveries of Vespucci and other explorers. He makes the statement: "Now a fourth part [of the world] has been found by Amerigo Vespucci, and I do not see why we should be prevented from calling it America or America." It is from this work that the New World became known as America.

VEST, George Graham, statesman, born at Frankfort, Ky., Dec. 6, 1830; died Aug. 9, 1904. In 1848 he graduated from Center College, Kentucky, and afterward studied law in the Transylvania University at Lexington. He removed to Missouri in 1853 and for some years pursued a successful law practice at Sedalia. In



GEORGE G. VEST.

1860 he became a member of the Missouri Legislature and subsequently served two years as a representative in the Confederate Congress and one year in the Confederate Senate. He was elected to the United States Senate in 1879,

3039

in which he continued to be an active and influential member until 1903. From 1893 to 1895 he was chairman of the Committee on Public Buildings and Grounds. Subsequently he held other important committee positions at various times. Vest is noted as an able orator and a leading member of the Democratic party.

VESTA (ves'ta), a distinguished divinity of Rome, regarded the goddess of fire and of the hearth. Her temple in Rome, containing as it



the nation, stood close beside the palace of Numa Pompilius. Neverceasing fire burned on her altar, which was attended by priestesses called Vestal Virgins. It is said that Numa established the vestals, four in number, but afterward they were increased to six. They were chosen from the noblest fam-

ilies in Rome at the ages

were the hearthstone of

of six to ten years and held their office for thirty years. The first ten years were devoted to initiating them in their religious duties, which they performed the second ten, and the third period was occupied in instructing new priestesses. They were supported from the public treasury and received many special privileges, such as the best seats in the theater and the honor of being accompanied by a lictor while riding in state. If they met a criminal on his way to execution they had the power to pardon him, provided the meeting was accidental. The vestals were vowed to chastity and a violation of the vow was punished by the offender being stoned to death or buried alive. The Vestalia, a festival held in honor of Vesta, occurred on the 9th of June and was celebrated exclusively by women, who walked barefooted in procession to the temple of the goddess. Citizens observed the feast by eating in their own homes, the articles consisting of bread, fish, and herbs, which were eaten before the hearth and in the presence of images dedicated to the Penates, the household gods. With the adoption of Christianity by Constantine, in the 4th century, the worship of Vesta ceased.

VESUVIUS (vê-sū'vĭ-ŭs), a famous volcano in Italy, situated near the Bay of Naples, about ten miles east of the city of Naples. The moun-



MONTE SOMMA AND THE CONE OF VESUVIUS.

tain rises from the plain of Campania. It has a circumference of 30 miles at its base and rises 4,225 feet above the level of the sea. The surrounding plain is about 2,200 feet above the sea, thus making the pyramidal cone 2,025 feet above the adjacent country. In ancient times it had but one peak, but now there are two distinct summits, known as Somma and Vesuvius. Monte Somma is a precipice forming the wall of an ancient, prehistoric crater greater than that of the present volcano, and the mountain is thought to be only half as high as in former times, its upper half having been blown away by a colossal eruption of which no historical record remains. The cone lies south of Monte Somma, from which it is separated by a valley known as Atrio del Cavallo, and at the western end of the valley is an observatory, at which the eruptions and indications of disturbances are studied. The distance across the cone is 2,000 feet and it slopes inward to a depth of 500 feet, forming a cup-shaped crater. Tourists may ascend to within a short distance of the mouth of the crater by a cable railway, where they secure a fine view of the surrounding country, and may study the substances brought up by volcanic eruptions, which include forty different

Though earthquakes and eruptions have taken place in the region of Vesuvius at various times since the beginning of the historic period, it has been densely populated for more than twenty centuries. The earliest recorded symptoms of activity occurred in 63 A. D., but it is reasonably certain that vast disturbances took place at a much earlier period. Pompeii and Herculaneum, two cities near the base of Vesuvius, were buried by an eruption in 79. Excavations made in modern times have established the fact that lava was not emitted during this eruption, but that the inundation took place by reason of the steam given off by the mountain becoming condensed into rain, which mixed with the light volcanic dust and flowed down the slope, thus

covering the surrounding region with a pasty mud. Numerous eruptions have occurred since The presence of internal fires gives evidence of constant activity. In 1036 a vast discharge of liquid lava flowed from the crater. It is estimated that the great eruption of 1631 destroyed 18,000 lives. In 1794 a vast stream of lava 1,210 feet wide destroyed the town of Torre de Greco. Other noted eruptions occurred in 1855, 1861, 1872, 1879, 1885, 1903, and 1905. The more recent earthquake in the vicinity of Messina, in 1908, was accompanied by extensive eruptions from Vesuvius. On the slopes of Vesuvius are fine gardens and orchards, producing grapes, oranges, lemons, apples, and vegetables.

VETCH. See Tare.

VETERINARY (věťer-ĭ-nā-ry), the branch of medicine that treats of the diseases and injuries of domestic animals and relates to their medical and surgical treatment. The practice of veterinary medicine and surgery is of considerable antiquity, treatises on that subject having been written by Hippocrates and other Grecians. However, the schools which teach veterinary science as an exclusive branch are of modern institution, the first on record being built at Lyons, Frances, in 1762. Shortly after similar schools were founded in various parts of Europe, or veterinary faculties were added to institutions already established. The first institution of that kind in England was founded in London, in 1791, and the first in Germany, at Berlin, in 1792. The leading veterinary schools in Germany have been raised to the position of university rank, especially those at Berlin and Hanover.

In the United States, veterinary science is taught mostly in private institutions, though some of the State institutions have departments devoted to that science. Chairs in veterinary medicine are maintained in Cornell College and Harvard and Pennsylvania universities. Special schools of veterinary medicine are located in Minneapolis, New York, and a number of other cities. Questions relating to veterinary science are referred by the government to the Department of Agriculture, being under the direct charge of the Bureau of Animal Industry. This is true likewise of Canada, where the veterinary director-general and live stock commissioner is an officer under the Department of Agriculture. The literature relating to the practice is very extensive, especially in the French, German, English, and Latin.

VETO (ve'to'), a Latin term, meaning I forbid, applied in civics to the power vested in one branch of the government of the state to negative the resolutions of another branch, or to the constitutional right of the chief executive to forbid or refuse to approve a legislative enactment. In Rome the tribunes of the people had power to stop any measure of the senate deemed injurious by pronouncing an interdico,

meaning I interdict. The laws of Poland, passed in 1652, vested the right of intercepting legislation in each individual deputy of the imperial diet, who entered his protest by issuing a nie pozwalam, signifying I do not permit it. In the United States the power to veto legislative enactments is vested in the President and in the governors of the several states. In various other offices it extends to officials having executive powers, such as the mayor of a city. The veto power in the United States is qualified, not absolute, for the reason that after it has been exercised a rejected measure may become a law by two-thirds of the members of each branch of the legislative body voting for its passage, when it is said to be passed over the veto of the executive.

In Great Britain the sovereign may veto a bill of Parliament, but that power has not been exercised since 1707, when assent to a bill regulating the militia in Scotland was refused by Queen Anne. In Canada, when a measure has passed both houses of Parliament, it is submitted to the Governor General for his signature. This official may reserve it for the consideration of the colonial secretary, if he considers that it interferes with imperial interests. The imperial government may disallow any such measure within two years. The governments of all nations recognize the right of veto in the sovereign, or some specially constituted body, but the veto power is greatest in the more autocratic governments, as in Russia, Turkey, and China.

VEUILLOT (ve-yo'), Louis Eugene, author, born in Boynes, France, Oct. 13, 1813; died in Paris, April 7, 1883. After finishing a college education, he secured a position in the department of the interior, and in 1844 became associated with the *Univers Religieux*, a periodical devoted to religious discussion. In 1850 he conveyed a large subscription of funds to the archbishop of Turin and on his return visited Rome. His writings are numerous, most of them being devoted to religious topics and directed against the socialistic tendencies of modern Europe. "La vie de Jésus Christ" is one of his best known works.

VEVAY (vě-vá'), or Vevey, a town of Switzerland, in the canton of Vaud, ten miles east of southeast of Lausanne. It is finely situated on the northern shore of Lake Geneva, at the mouth of the Veveyse River, and is famous as a health resort and residence of foreigners. A railway line passing along the shore of Lake Geneva furnishes transportation facilities. Among the noted buildings is the Church of Saint Martin, which contains the tomb of Broughton. It has a number of excellent schools. A fine bridge crosses the Veveyse. The surrounding country is noted for its fine orchards, vineyards, and beautiful climate. It has manufactures of wine, condensed milk, and watches. Population, 1916, 12,980.

VIADUCT (vī'à-dukt), a structure for carrying a road across a deep valley or a ravine, differing from a bridge in that the piers are the most prominent features in its construction. Formerly viaducts were made largely of wood or stone, but now they are constructed chiefly of iron and steel. In most cases heavy foundations are made of concrete or stone, upon which the piers of steel rest, and the stringers are likewise of steel. Several short spans usually make up a viaduct and the piers are shaped in the form of towers. The longest viaduct in the world is at Boone, Iowa, constructed in 1901 by the Chicago and Northwestern Railroad Company, as a means of crossing the Des Moines River. It has two tracks, is 185 feet high, and has a length of 2,685 feet. A similar viaduct crosses the Des Moines River at Fort Dodge, Iowa. Other noted viaducts include those at Valley City, N. D.; across the Pecos River, in Texas; and at Gokteik, Burma. See

Bridge; Valley City. VIA MALA (ve'à ma'là), a remarkable gorge in Switzerland, situated in a portion of the canton of Grisons called Hinterrheinthal (Farther Rhine Valley). The walls of the gorge are 1,350 to 1,600 feet high, forming a narrow space between, and at the bottom flows the Hinter Rhine. Formerly the gorge was called the Lost Gulf, owing to the difficulty experienced in reaching it, but a fine road was built along its sides in the early part of the last century. The roadway crosses and recrosses the narrow gorge from side to side by bridges fully 400 to 625 feet above the river. This roadway is necessarily narrow, since it was required to blast the hard rock with powerful explosives, but it is one of the grandest and most beautiful passageways in Europe. The region is visited

by many tourists.

VIAUD (vê-ô'), Louis Marie Julien, sailor and author, born in Rochefort, France, Jan. 14, 1850. He descended from a Huguenot family and in 1867 entered the navy. In 1881 he was promoted to the rank of colonel and served with distinction in the Tonquin campaign. He was decorated with the cross of the Legion of Honor in 1878 and made a member of the French Academy in 1891. His works were generally published under his pseudonym, Pierre Loti. As a writer he is classed with the romanticists, as opposed to the realistic school, and his novels have a strong vein of imagination and charming style. His writings are very numerous, including "Matelot," "Aziyadé," "Au Maroc," "Madame Chrysanthème," and "Fantôme d' Orient."

VIBURNUM (vf-bûr'nům), a genus of shrubs and small trees of the honeysuckle family, which embraces about eighty species. The branchlets are opposite, the leaves are entire or serrate, the buds are naked, and the flowers are axillary or in terminal clusters. The fruit is a dry or fleshy drupe, having one seed. Twelve

species of viburnum have been catalogued in North America, including the arrowwood, hobble bush, sweet viburnum or sweet berry, and dockmakie or maple-leafed viburnum. The last mentioned grows to a height of six feet and in appearance resembles young maples. Several species yield medicinal properties and a yellowdye is obtained from the branches. A species known as viburnum lentago, or the wayfaring tree, is native to the warmer parts of Europe and Asia. It is planted as an ornamental shrub for its small, white flowers and handsome leaves. The laurestinus is a species with evergreen leaves and clusters of rose-colored flowers. It is valued as a plant for house decoration.

VICAR (vĭk'ēr), an official in some of the Christian churches, or the term applied to a person who serves as deputy to another. In the Church of England a vicar is a priest of the parish, the revenues of which belong partly to another body or corporation. Such a priest is supported by the lesser tithes or a special endowment. A vicar-general in the Roman Catholic Church is a priest who acts as the deputy of a bishop in the government of the diocese, but his duties are confined to matters that do not demand full episcopal functions. The Pope assumes the dignity of vicar of Christ on earth.

VICENZA (vê-chĕn'tsa), a city of Italy, capital of the province of Vicenca, forty miles northwest of Venice. It is situated on the Bacchiglione River and is surrounded by a farming and fruit-growing country. The city is well built, has railway facilities, and is lighted by gas and electricity. The chief buildings include the townhall and a number of famous churches, including the cathedral and the Church of Madonna del Monte. It has a public library of 54,500 volumes, an art academy, and several fine schools. The manufactures include woolen goods, leather, straw hats, musical instruments, and machinery. In the 12th century it belonged to the Lombard League, which opposed Frederick Barbarossa. In 1404 it became subject to Venice, but is now an integral part of Italy.

Population, 1916, 65,678. VICHY (ve-she'), a town of central France, in the department of the Allier, about sixty miles northwest of Lyons. It occupies a fine site on the Allier River and is surrounded by picturesque hills covered with vineyards and orchards. Vichy is noted for its numerous mineral springs, whose waters are strongly impregnated with various saline substances. It has commodious hotels and summer villas and is famous as a summer resort, its health and pleasure seeking visitors often numbering many thousands annually. The waters are bottled and sold in the market. Fine baths are maintained at the hotels for the accommodation of visitors. Soda is the leading constituent of the water, which ranges in temperature from 40° to 115° Fahr. Persons suffering from indigestion, gout,

191

3042

chronic catarrh, and other ailments find the application of the water of lasting benefit. The value of these springs was known to the Romans. Many remains of marble baths dating from Roman occupation have been found in the vicinity. Population, 1916, 15,524.

VICKSBURG (viks'burg), a city of Missis-

sippi, county seat of Warren County, 44 miles west of Jackson. It is on the Mississippi River, a short distance below the mouth of the Yazoo, and has communication by the Yazoo and Mississippi Valley and the Oueen and Crescent railroads. The principal buildings include the county courthouse, the Charity Hospital, the Cherry Street College, the Federal building, and the Saint Aloysius College. It has wellpaved streets, public waterworks, sanitary sewerage, and electric street railways. The national cemetery contains 16,727 graves. The manufactures include cotton-seed oil, oil cake, machinery, lumber products, boots and shoes, carriages and wagons, saddlery, clothing, and tobacco products. Vicksburg was settled in the early part of the 19th century and was incorporated in 1840. It was strongly fortified in 1861 and attempts to capture it were made by the Federal forces under Sherman and Farragut in 1862. Since it was the only strong position on the Mississippi in the hands of the Confederates, General Grant conducted a siege against the city until July 4, 1863, when it surrendered with

31,600 men and 60,000 muskets. Population,

1900, 14,834; in 1910, 20,814.

VICKSBURG CAMPAIGN, the name of a series of operations in the Civil War of the United States, the purpose of which was to capture Vicksburg, Miss., and ultimately secure control of the Mississippi. In December, 1862, General Grant, aided by General Sherman, began the campaign with an army of 48,000 men. The former advanced against the city by land. while General Sherman descended the river, but was repulsed at Chickasaw Bluffs on the 20th. This temporary defeat caused the campaign to be abandoned until January, 1863, when General Sherman proceeded to attack the Confederates at Haines's Bluff, while McPherson and Mc-Clernand planned to cross the river from the west side under protection of the gunboats under Commodore Porter.

A preliminary victory was won by the Federals at Port Gibson in April and as a result the lines of the Confederates were contracted. Grant and Sherman won a victory at Champion Hill and the Big Black River in May, and the Confederates under Pemberton were compelled to retreat into Vicksburg. Grant undertook to capture the city by assault in May, but, failing to do so, he decided to begin a siege. He held a position on the center, while Sherman was on the right and McClernand on the left. Porter held the Federal base of supplies along the Yazoo River. A lack of supplies and disease made it necessary for Pemberton to surrender, which he did after withstanding a siege for 47 days. The surrender took place on July 4, 1863, the day following the Federal victory at Gettys-

VICTOR (vik'ter), a city of Colorado, in



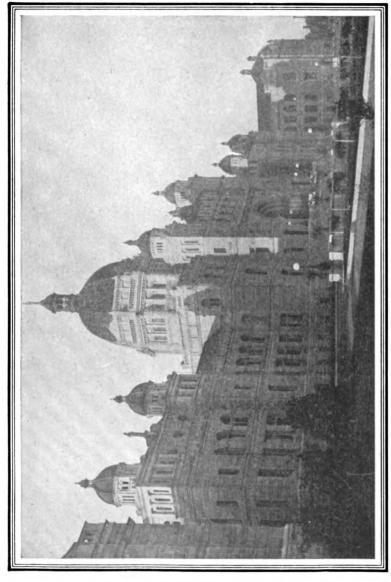
MAP TO SHOW THE VICKSBURG CAMPAIGN.

Teller County, about six miles southeast of Cripple Creek, on the Midland Terminal, the Florence and Cripple Creek, and other railroads. It is surrounded by a productive gold and silver producing region, to which it owes its prosperity. The features include the high school, the public waterworks, and picturesque mountain scenery. Among the industries are bottling works, lumber mills, smelters, and ore-sampling works. It has a large trade in merchandise. The place was platted and incorporated in 1894. Population, 1900, 4,986; in 1910, 3,162.

VICTOR, the name of three popes and two antipopes of Rome. See Pope.

VICTOR EMMANUEL II., King of Italy, born in Turin, March 14, 1820; died in Rome, Jan. 9, 1878. He was the eldest son of Charles Albert, King of Sardinia, and received a liberal education under the Jesuits. In 1842 he married the Archduchess Adelaide of Austria. He was a commander in the campaign of 1848-1849 and displayed much gallantry at Goito and Novara, defeating the Austrians with considerable loss. His father abdicated after the latter battle, on March 23, 1849, and Victor Emmanuel became King of Sardinia. The Austrians demanded that the Sardinian constitution granted by his father should be withdrawn, but he insisted upon maintaining it, thus making himself popular with the people of Italy, who came

63)		
	÷	(4)



PARLIAMENT HOUSE AT VICTORIA

On Belcher Avenue, between the business district and the wharves, is a group of public buildings surrounded by extensive lawns and facing a space where stands the statue of the first Governor of British Columbia. The central edifice of the group is the Parliament House. On one side stands the Provincial Museum and on the other the Government Offices. Their handsome stone façades, above which rises the great rounded dome of the Parliament Building, have a striking and harmonious effect. (Art. Victoria) to call him the *Honest King*. He found a wise counselor in Count Cavour, with whose assistance he reorganized the army, regulated the finances, reformed the civil service, and secularized the church property, but for the last named public act was excommunicated by the Pope. In 1853 he took part with the European powers against Russia in the Crimean War and in 1859 formed an alliance with France, thus enabling him to renew the contest against Austria.

He commanded in the battles of Magenta and Solferino and by the Peace of Villafranca added Lombardy to his dominion, but ceded Nice and Savoy to France. Tuscany, Parma, Romagna, and Modena voted to consolidate with Sardinia, and all of southern Italy was united under Victor Emmanuel when Garibaldi conquered Naples and Sicily. He assumed the title of King of Italy on March 17, 1861, and the Peace of Vienna, in 1866, growing out of an alliance with Prussia, caused Austria to cede Venetia. At the outbreak of the Franco-German War of 1870-1871 Napoleon was compelled to withdraw the French garrison from Rome, when that city became the capital of United Italy. Victor Emmanuel entered Rome on July 2, 1871, Florence having been the capital since 1865. The epoch of his entire government extended over 29 years, and his reign over United Italy covered a period of eight years. He was succeeded by his son, Humbert I.

VICTOR EMMANUEL III., King of Italy, born Nov. 11, 1869. He was educated at Rome under the direction of Colonel Osio, who was

strict in his dis-

cipline and thorough in

outlining in-

struction. In

1889 he completed his mili-

tary education

and was given

a command in

the national

division of troops stationed

where he demonstrated much

Naples,



victor emmanuel III. His official acts demonstrated his devotion to the constitution and a liberal government. He improved the discipline

of the army and fostered education. At the time of the earthquake in the vicinity of Messina, in 1908, he did much to relieve the suffering caused by the catastrophe. See **Humbert I**.

VICTORIA (vik-tō'rī-a), a city in Texas, county seat of Victoria County, on the Gaudalupe River, 95 miles southeast of San Antonio. It is on the Southern and the San Antonio and Aransas Pass railroads. The surrounding country is a fertile region. Among the principal buildings are the county courthouse, the city hall, the high school, the Nazareth Seminary, and the Saint Joseph's College. It has manufactures of cotton-seed oil, dairy products, cigars, and machinery. The municipal improvements include waterworks and sanitary sewerage. Population, 1900, 4,010; in 1910, 3,673.

VICTORIA, a seaport city of Vancouver Island, capital of British Columbia, on the northern shore of the Strait of Juan de Fuca It has communication by electric railways and by the Esquimalt and Nanaimo Railroad. Regular lines of steamers are maintained with the city of Vancouver, Seattle, and other ports on the Pacific. Esquimalt, about three miles distant, with which it is connected by an electric railway, has a fine harbor. The streets are wide and regularly platted, crossing each other at right angles. They are improved by substantial pavements, drainage and sanitary sewerage, and electric lighting. The municipality has a fine system of public waterworks.

Victoria has extensive commercial interests with the Orient and Australasia. The manufactures include flour, chemicals, earthenware, hardware, soap, leather, lumber products, ships, spirituous liquors, and machinery. Among the notable buildings are the customhouse, the post office, the government house, the city hall, the Anglican and Roman Catholic cathedrals, and the Anglican Woman's College. It has a number of excellent public schools, hospitals, orphanages, and private institutions of higher learning. The place was originally a trading post of the Hudson's Bay Company, but was platted in 1852 and incorporated as a city in 1862. Owing to the fine climate and interesting scenery, it is popular as a resort for tourists. Population, 1901, 20,919; in 1911, 31,660.

VICTORIA, a State of the Commonwealth of Australia, situated in the southeastern part of the continent. It is bounded on the north and northeast by New South Wales, east by the Pacific Ocean, south by the Pacific Ocean, Bass Strait, and Indian Ocean, and west by South Australia. Bass Strait separates it from Tasmania. The length from east to west is 448 miles and the general width is about 235 miles. It has an area of 87,884 square miles, hence is the smallest State in the Commonwealth.

DESCRIPTION. An irregular range of mountains traverses the State from west to east, forming the southern extension of the Great Dividing Range. Most of the surface consists

of unwooded plains, and the northwestern part belongs to the region of the Great Plains. The Australian Alps are in the eastern part, from which numerous chains trend in various directions, and toward the west they merge into the Grampians. Mount Bogong, height 6,512 feet, and Mount Hotham, height 6,075 feet, are the highest peaks of the Australian Alps within the State. Mount William, height 5,590 feet, is the most elevated summit of the Grampians. Ranges known as the Pyrenees and the Hume Range extend in ridges between the Australian Alps and the Grampians. Belts of timber extend along the streams and scattered groups of trees characterize the undulating plain. The varieties of forest trees are very numerous, including the eucalypti or gum trees, she oak, honeysuckle, cherry, acacia, and allied species. In most of the regions that have timber the trees are widely apart and the surface is quite free from underbrush, thus affording a good growth of grasses.

The drainage belongs to two systems, one sloping toward the south and the other forming a part of the Murray valley. Most of the streams are short and not navigable. The Murray forms the larger part of the boundary between the State and New South Wales and receives the inflow from the Owens, Goulburn, and Campuspe rivers. Among the streams flowing toward the south are the Mitchell, Tambo, Taylor, Yarra, and Wannon. Port Philip Bay, with an area of 870 square miles, is an important inlet from Bass Strait. Numerous small lakes with saline waters are found in the northwestern part and these have no outlet to the sea.

Though sudden changes occur in the condition of the atmosphere, the climate is generally healthful and agreeable. The extremes of temperature range from 32° to 110° and the annual average is about 58°. January is the warmest and July the coldest month. Ice sometimes forms in the coldest part of July, but it disappears before the sun reaches the meridian. The year may be divided into two seasons, the hot, dry season, extending from October to March, and the moist, cool season, from April to September. Rainfall is heaviest in the eastern part, where it is from 30 to 50 inches, but it decreases gradually toward the northwest, where it does not exceed 10 to 14 inches. Drouths are not infrequent in this section.

MINING. The State has extensive deposits of minerals and has yielded about two-thirds of the gold obtained in Australia. The annual output of gold averages about \$15,750,000. Granite, iron, coal, copper, tin, lead, and zinc are obtained in considerable quantities. Precious stones of much value occur in the mountains, especially garnet, ruby, agate, topaz, and sapphire. Mining is conducted by modern methods, chiefly with machinery and British capital, and the exportations are extensive.

AGRICULTURE. Farming is a more extensive enterprise in Victoria than in any other State of the Commonwealth. This is due to the fact that the rainfall in the southern and eastern parts is normally certain and that a large portion of the State has soil of much fertility. Wheat is grown on nearly half of the cultivated land and is the leading crop. Both oats and wheat are raised to some extent for hay, and, when grown for that purpose, they are cut green. However, the yield of oats is large and this cereal takes rank as the second crop of importance. Other farm products include barley, rye, vegetables, and fruits. Grapes are cultivated very extensively, yielding large quantities of the finer species. The sheep and wool industry has improved materially with almost every decade, and correspondingly large interests are vested in rearing cattle and horses of a fine grade. Other domestic animals include mules, swine, goats, and poultry.

MANUFACTURES. The manufacturing enterprises were retarded in their development to some extent by the profitable investments in mining and farming, but they are now in a state of healthful growth. Many of the industries are connected with the mines, especially in smelting and machine shops. Other enterprises include flour and grist mills, clothing and textile factories, potteries and brickyards, vintages, breweries, metal works, creameries, and cheese factories. The fisheries furnish considerable material for curing and canning. Large quantities of fruit are canned for exportation. Among the general manufactures are saddlery, hardware, cigars, preserved meats, and uten-

sils.

Transportation. The State has 3,750 miles of railroads in operation, and electric railways are operated in the larger cities and many of the rural districts. All of the railroads are owned and operated by the government under a commissioner. Most of the lines are in the central part of the State, but the system is connected with those of New South Wales and South Australia. The trade is largely with Great Britain, but considerable foreign trade is carried on with France, Germany, and the Netherlands. Among the exports are wheat, wool, gold, butter and cheese, live stock, hides, and preserved meats. The imports consist chiefly of clothing, machinery, and metal wares. In the volume of trade Victoria ranks next to New South Wales. Melbourne and Geelong, both on Port Phillip Bay, are the leading ports.

GOVERNMENT. The State has government similar to that of the other members of the Commonwealth. Its chief executive is a Governor appointed by the British crown. Legislative authority is vested in the Parliament, which consists of a legislative council and a legislative assembly. The former has 35 members elected for six years, and the latter has 68 members elected for three years. A property

qualification is required to permit voting for members of the upper house, but such is not the case when voting for members of the assembly. Local government is administered in subdivisions corresponding to the towns and counties of Canada. The government has fostered the extension of transportation facilities and encouraged the development of the material industries.

EDUCATION. Elementary and secondary schools are maintained under the direction of the State. Attendance upon school is compulsory and free between the ages of six and thirteen years. Practically all the adult population above the age of fifteen years is able to read and write. The larger part of secondary instruction is in the hands of private and denominational interests. Melbourne has a fine university, with which are connected a museum, a library, an observatory, and zoölogical and botanical gardens. Other higher institutions include several colleges, normal schools, technical institutes, schools of agriculture and horticulture, and schools of mines.

INHABITANTS. The inhabitants consist largely of Europeans and their descendants. About three-fourths of the people are Protestants. Among the leading denominations are Anglicans, Roman Catholics, Presbyterians, Wesleyans, and Episcopal Methodists. Melbourne, in the south central part, is the capital. Other cities include Ballarat, Geelong, Sandhurst, Williamstown, Footscray, and Hamilton. The population in 1910 was 1,315,747. This included 5,601 Chinese and 196 natives.

HISTORY. Captain Cook visited the coast in 1770 and George Bass made explorations in 1798, discovering Bass Strait. Lieutenant Murray took possession of Port Phillip Bay in 1802. The first permanent settlement was made by the Henty family on Portland Bay in 1834, after which whale fishing and sheep raising began to The region was incorporated with New South Wales in 1835 and was formally opened for settlement the following year. Melbourne was platted in 1837 and soon developed trade with the interior. It was separated from New South Wales in 1850 and the colony of Victoria was organized the following year.

A large number of immigrants came to the colony in 1851, when gold was discovered. Within ten years the population increased to 540,322. Melbourne became a city in 1856 and soon obtained a large interior and foreign trade, while Geelong, on the opposite side of Port Phillip Bay, became an important trade center. The colony rapidly developed its agricultural, mining, and stock-raising interests, making it the most prosperous and densely populated of the Australian provinces. With the building of railroads to all sections and the navigation of the Lower Murray, settlements and trade were carried to the interior points. The people, being generally in favor of

Australian federation, ratified the federal constitution by a large majority in 1898. A general strike of laborers occurred in 1907, but it was finally settled by arbitration.

VICTORIA, a genus of plants that resembles the common water lily, so named in honor of Queen Victoria. A species known as Victoria regia is the largest of the water lilies. The leaves of this plant are nearly round and have a diameter of five or six feet, floating on the surface of the water, and the flowers are about fourteen inches in diameter. These flowers are quite fragrant, have a rose color, and appear among the leaves upon prickly stalks. Several species are found in the northeastern part of South America, especially in the swamps and lagoons lying between the Amazon and the Orinoco. They have been brought to Europe and North America for cultivation in hothouses, where they are admired for their large size.

VICTORIA I., Alexandria, Queen of Great Britain and Ireland and Empress of India, born at Kensington Palace, May 24, 1819; died Jan.

22, 1901. She was the only child of the Duke of Kent and of Louisa Victoria, Princess of Saxe-Coburg-Saalfeld and the granddaughter of George III. Her father died in 1820, when she was but eight months old, and her education was left to her mother, who



QUEEN VICTORIA I.

trusted her to the Duchess of Northumberland for instruction. She succeeded her uncle, William IV., on June 20, 1837, as Victoria I., and was officially crowned at Westminster in 1838. Victoria was the sixth sovereign of the house of Hanover. On Feb. 10, 1840, she married Prince Albert, of the German house of Saxe-Coburg-Gotha, who descended from King Wettin, the founder of the house of Saxe-Coburg-Gotha and contemporary of Charlemagne. This union was an unusually happy one. The royal couple had four sons and five daughters. The nine descendants include the following: Vicnine descendants include the following: toria, married in 1858 to Frederick William, later Emperor of German, died in 1901; Albert Edward, now Edward VII., married in 1863 to Alexandra of Denmark; Alice, married in 1862 to Prince Frederick William of Hesse, died in 1878; Alfred, married in 1874 to Marie of Russia, died in 1901; Helena, married in 1866 to Prince Christian of Denmark; Louisa, married in 1871 to the Marquis of Lorne; Arthur,

married in 1879 to Princess Louise Marguerite of Prussia; Leopold, married in 1882 to Princess Helena of Waldeck, died in 1884; and Princess Beatrice, married in 1885 to Prince

Henry of Battenberg.

Lord Melbourne was at the head of the government when Queen Victoria ascended the throne, but he was succeeded in 1841 by Robert Peel. Other leaders of distinguished statesmanship succeeded to the government from time to time, thus making her entire administration characterized by wise leaders. Her long reign of about 64 years, the longest in England, witnessed notable changes in the history and geography of the world, and within that period Great Britain extended its territory very materially. Though colonial wars were frequent and various disturbances occurred in Ireland, England passed through a comparatively long era of peace, prosperity, and industrial development. The revolutionary period of 1848 was safely bridged over and the queen lived in the time of many important historical events, among them the Civil War in the United States, the union of the kingdom of Italy, the rise of the German Empire, and the establishment of the French Republic. Among the leading events of her reign are the abolition of the Corn Laws, the adoption of the penny postage, the Catholic Emancipation act, the enfranchisement of the Jews, the Crimean War, the Irish Land Act, the rebellion in India, and more or less important wars in Egypt, Afghanistan, and South Africa.

Her husband died in 1861 and she lived in comparative retirement until 1876, when she again personally attended the opening of Parliament and was proclaimed Empress of India. The life of Victoria stands as an example of piety and devotion, though in governmental matters she exercised little potent influence, leaving the conduct of state affairs largely to the public ministers. While her reign was of longer duration than that of any English sovereign, it was surpassed by only a few rulers, Louis XIV. of France being a notable example. The fiftieth year of her reign was celebrated by the British people as a golden jubilee in 1887, and ten years later they celebrated the diamond jubilee with imposing ceremonies. She patronized learning and art and aided in the publica-tion of a number of works. These include "Early Days of His Royal Highness the Prince Consort," "Leaves from the Journal of Life in the Highlands," and "Life of the Prince Con-She was succeeded by her son, who as-

sumed the title of Edward VII.

VICTORIA CROSS, a naval and military decoration of Great Britain, which was instituted by royal warrant on Jan. 29, 1856, and bestowed for conspicuous bravery and devotion to the country in the presence of the enemy. It is open to all officers and men of the regular and reserved forces, and is a much coveted decoration. The Victoria Cross originated in

connection with the Crimean War. It consists of a bronze Maltese cross, bearing the figure of the crown surmounted by a lion, and on the scroll below are the words, For Valour. The decoration is accompanied by a pension, and holders are entitled to add the letters V. C.

VICTORIA FALLS, an extensive cataract of South Africa, in Rhodesia, on the Zambezi River. It is located a few miles below the confluence of the Kwando and the Zambezi, about 225 miles northwest of Bulawayo, and excels the Niagara both in height and in the volume of water. The Zambezi flows over a broken and brush-covered plateau and is a mile wide some distance above the point where it plunges into a chasm 400 feet deep, but this chasm is not more than 300 feet in width at the bottom. A dense cloud of vapor rises above the falls, hence the native name Mosi-wa-Tunya, meaning roaring smoke. The famous Victoria bridge of the Cape-to-Cairo Railway crosses the river just above the falls. It is the highest structure of the kind in the world, being 420 feet above the water, and is 600 feet long. It is constructed of steel and affords a fine view of the falls.

VICTORIA NYANZA (nyān'zā), an extensive fresh-water lake of Africa, the largest of the great equatorial lakes, lying directly under the Equator and about 400 miles from the Indian Ocean. It is about 3,500 feet above sea level and has an area of 26,250 square miles. The waters are not excessively deep, but it has a number of deep bays, and near its shores are a number of fertile islands. Sesse, in the northwest, and Ukerewe, in the southeast, are the largest of these islands. Captain Speke, an African traveler, discovered the lake in 1858. It is now considered the source of the Nile, the overflow passing through the White Nile into Lake Albert Nyanza, about 100 miles northwest. The discharged water forms in its course three cataracts, known as Ripon, Karuma, and Murchison falls, the last named having a descent of 120 feet. The southern half of Victoria Nyanza belongs to German East Africa and the northern half to British East Africa. In its vicinity are extensive forests and an abundance of animal life. It has fine fisheries.

VICUÑA (vê-koon'ya), a species of llamas found in South America, immediate in size between the alpaca and the llama. It has a long and slender neck and is covered with a short, curled wool. The color is a rich brown, but patches of white occur on the legs and on the shoulders. These animals ascend great elevations in the Andes and are usually seen in small herds. They are wild and difficult to approach. The Indians entrap them by constructing a circle of stakes nearly a mile in circum-

VIENNA (vi-ĕn'nà), in German Wien, the capital and largest city of Austria-Hungary, on the Danube River, near the foothills of the

Wiener Wald, the eastern extremity of the Alps. It is 330 miles southeast of Berlin, has a temperate climate and an annual rainfall of 24 inches, and is about 562 feet above the sea. The city is the converging center of a large number of important railroads and through it passes the Danube Canal, an extensively improved branch of the Danube River, into which the Wien, a small stream, carries its waters. It is a well-built and handsome city, having straight and spacious streets, fine squares, and numerous public parks. In the number of its large and handsome modern buildings Vienna ranks with any of the European capitals. It is officially divided into ten municipal districts. The older part is known as the inner town, and lies almost exactly in the center of the others. That portion is still the most aristocratic quar-

In the inner town are the principal hotels, many of the embassies and legations, government offices, and the palace of the emperor. The other districts include Leopoldstadt, Landstrasse, Wieden, Margarethen, Mariahilf, Neubau, Josefstadt, Alsergrund, and Favoriten. Leopoldstadt is the chief commercial center and has many Jewish inhabitants. Alsergrund contains the military hospital, the municipal asylum, and an extensive general hospital. The principal manufacturing industries are carried on in Neubau, Mariahilf, and Margarethen, and the chief officials have their seat in Landstrasse. Ring-strasse, which encircles the inner city, is the finest street of the city and takes rank with the most beautiful thoroughfares in the world. Among the larger buildings are those of the government, including the fine imperial palace, the houses of parliament, the courts of justice, the customhouse, and the modern palaces of the archdukes and others of the nobility. Other noteworthy structures include the city hall, the Hofburg Theater, the municipal library, the Cathedral of Saint Stephen, the Chamber of Commerce, the Imperial Opera, the Albertina Library, and the central railroad station. Schönbrunn, the imperial summer residence, is about two miles from the city.

Vienna is the intellectual center of Austria-Hungary. It contains many famous churches and religious associations, numerous schools and institutions of secondary learning, and a fine university. It has the Vienna Conservatory of Music, the Polytechnic Institution, the Austrian Museum of Art, and the Military Geographical Institute. The imperial library has 900,000 volumes and about 25,000 manuscripts, and in connection with it is one of the finest imperial museums of Europe. Besides well-organized kindergarten and elementary schools, the city has a military institution, an agricultural academy, a conservatorium of music, many commercial colleges, numerous Protestant and Roman Catholic theological seminaries, and various institutions of science, art, industry, and technical learning. The noted monuments include one to Schiller, in Schillerplatz; one to Joseph II., in Josephplatz; one of Goethe, near the Palace of Justice; one of Schubert, in the Stadt Park; one of Beethoven, near the Academic Museum; and one to Prince Eugene, in Burgplatz. Fine specimens of paintings by Dürer, Rubens, and other masters are in the picture gallery of the Belvedere Palace, formerly a residence of Prince Eugene. The regalia of Charlemagne and other imperial treasures are stored in the treasury.

The streets of Vienna are paved substantially and provided with all the modern facilities. It has gas and electric lighting, an extensive electric street railway system, waterworks, sewerage, and well-organized police and fire depart-Whether the visitor desires to attend the Cathedral of Saint Stephen, containing the tombs of Frederick III. and Prince Eugene of Savoy, or view the other beautiful churches, the palaces, monuments, or public parks, it is possible to reach them all by modern rapid transit, carriages, or cabs. Like Paris, the city is remarkable for the extensive use of bicycles and automobiles upon its streets. Vienna is not only the center of art and education in Austria, but of its manufacturing and commercial industries. The extensive system of railways and navigation on the Danube facilitate a large interior and export trade. Among the manufactures are leather, soap, cotton and silk textiles, paper, woolens, carriages, velvet, musical instruments, embroidery, porcelain, firearms, machinery, sailing vessels, boilers, and engines. The meerschaum pipes, musical instruments, and bent-wood furniture made in Vienna are exported in large quantities.

The site occupied by Vienna was originally a part of the Celtic settlements of Europe. A military post, called Vindobona, was established here by the Romans, and it was the place where Marcus Aurelius died in 108. When the barbaric tribes occupied the territory of ancient Rome, it was taken by the Huns under Attila, but its growth dates from the time of the Crusades, when it became the center of a considerable trade. The Hapsburgs made it their capital in 1276, after which it passed into history as the scene of many memorable military contests. In 1477 the Hungarians besieged it unsuccessfully. It was defended successfully against the Turks under Sultan Solyman the Magnificent in 1529 and a second Turkish invasion in 1683. Under Ferdinand I. it became the seat of the German emperors. The Congress of Vienna assembled here on Nov. 1, 1814, to organize the affairs of Europe after the first overthrow of Napoleon, but the escape of that military leader from Elba, in 1815, broke up the conference, although its acts were formally sanctioned by the powers on June 9, 1815. A large majority of the inhabitants are Roman Catholics. About 75,000 Jews reside in the city. German is the spoken language. Population, 1910, 2,030,850.

VIENNA, Congress of, a convention of the leading nations of Europe, held at Vienna, Austria, in 1814. It was called for the purpose of settling the affairs of Europe after the wars of Napoleon and convened on Sept. 30, 1814. Among the countries represented were Austria, England, France, Prussia, Portugal, Russia, Sweden, and Spain, but representatives were present from all the larger countries except Turkey. The rulers who attended in person included Emperor Francis of Austria, Alexander I. of Russia, and Frederick William III. of Prussia. Among the chief adjustments of territory were included the annexation of Lombardy and Venice to Austria; the erection of Belgium and Holland into a kingdom under William I.; the annexation of Savoy and Piedmont to the kingdom of Sardinia; the retention of Malta and Helgoland by Great Britain, of which the Hanover dynasty was given dominion; the retention of Naples, by Murat; the establishment of a constitution for Germany; and the annexation of Swedish Pomerania, a part of Saxony, the Rhine province, and the duchy of Posen to Prussia. Additional provisions included that Norway should be retained by Sweden, that Denmark and Lauenburg should be united, that the duchy of Warsaw be made a part of Russia, and that Cracow be erected as a free state under the protectorate of Austria, Prussia, and Russia. In February, 1815, Napoleon suddenly escaped from Elba. This caused the congress to disperse immediately, but its provisions were carried out after the fall of Napoleon in that year. The treaty was finally signed on June 9, 1815.

VIENNA, University of, an institution of higher learning in Vienna, Austria, one of the most celebrated of Europe. It was founded by Duke Rudolph IV. in 1365, but its period of prosperity began in 1384, when a theological faculty was added. The Jesuits obtained control of it under Ferdinand II., in 1623, when it was greatly enlarged by the addition of numerous buildings, and it has since maintained a high position, especially for its medical department. The institution now has faculties of medicine, theology, law and political science, and philosophy. With it are affiliated a number of museums, seminaries, colleges, medical clinics, and laboratories in art and science. Maria Theresa founded its library in 1775, which now contains 600,500 volumes. The attendance averages 6,125 students, many coming from abroad.

VIEUXTEMPS (vye-tan'), Henri, violinist and composer, born in Verviers, Belgium, Feb. 20, 1820; died June 6, 1881. He began to study the violin when five years of age and in 1833 made a tour of Germany. Later he studied music under Simon Sechter in Vienna. He made successful tours of Moscow, Saint Petersburg, and other European cities and became solo violinist to the Czar of Russia in 1846. In 1871 he was made professor of the violin at the Con-

servatory at Brussels, but was soon after stricken with paralysis. As a violin virtuosi and a composer of music he took high rank.

VIGFUSSON (vig'foo-sun), Gudbrand, educator and author, born in Frakkanes, Iceland, March 13, 1827; died in Oxford, England, Jan. 31, 1889. After studying at Reikiavik, he attended the University of Copenhagen, and made the Danish capital his residence from 1849 to 1864. In the latter year he went to England, where he busied himself for ten years on the Icelandic Dictionary. He was made professor of the Icelandic language and literature at Oxford in 1884, which position he held until his death. His chief writings include "An Icelandic Reader," "Timatal," an essay on the chronology of the Icelandic Sagas, and "Stulunga Saga." These works have been widely translated.

VIGNAUD (vê-nyō'), Henry, diplomat and author, born in New Orleans, La., Nov. 27, 1830. He began teaching in 1852 and occasionally contributed to newspapers in New Orleans. In 1857 he founded L'Union de La Fourche, a French newspaper at Thibodaux, La. Subsequently he was one of the founders of La Renaissance Louisianaise at New Orleans, but at the beginning of the Civil War joined the Confederate army as captain. He was made assistant secretary of the Confederate diplomatic commission in Paris in 1863, and in 1869 became secretary of the Rumanian legation in Paris. In 1872 he served as translator at Geneva to the Alabama claims commission, in 1875 entered the diplomatic service of the United States, and for some time was secretary in the United States embassy at Paris. He published "Toscanelli and Columbus-the Letter and Chart of Toscanelli on the Route to the Indies by Way of the West" and "Critical and Biographical Notices of all Voyages which Preceded and Prepared the Discovery of the Route to the Indies by Diaz and to America by Columbus.'

VIGNY (ven-ye'), Alfred, poet, born at Loches, France, March 27, 1799; died Sept. 18, 1863. He entered the military service in 1816, but retired after eight years to devote himself to a literary pursuit. His writings belong to the romantic school and may be classed with the leading poetical productions of France in the last century. Besides producing a large number of poems, he wrote several novels and dramas. "Chatterton" is his leading drama and "Cinq-Mars," an historical novel, is considered his best work in prose. Among his leading poems are "Eloa," "Poèmes," and "Le Déluge."

VILAS (vi'las), William Freeman, statesman, born in Chelsea, Vt., July 9, 1840; died Aug. 29, 1908. His parents removed to Madison, Wis., in 1851, and he graduated from the Wisconsin State University in 1858. After studying law in the Albany Law School, New York, he was admitted to the bar, and at the outbreak of the Civil War entered the Union service. In

1863 he resigned to practice law at Madison, and shortly after became trustee of the University Law School. He served in the Wisconsin Legis-



WILLIAM F. VILLAS.

lature one term. President Cleveland appointed him Postmaster-General in 1885, and later made him Secretary of the Interior. He became a member of the United States Senate in 1891 and in 1896 supported the single gold standard movement. He aided in editing the Wisconsin Supreme Court Reports.

VILLAFRANCA (vēl-lä-frän'kä), a town of northern Italy, nine miles southwest of Verona, on the Tartaro River. Formerly it was strongly fortified and played an important part in the military movements of Southern Europe. The Austrians under General Radetzky defeated the Sardinians under King Charles Albert at Villafranca on July 25, 1848, and the Italians were defeated here by the Austrians on Jan. 24, 1886. The Treaty of Villafranca, concluded July 11, 1859, between Francis Joseph of Austria and Napoleon III., terminated the Italian war and conveyed Lombardy to Victor Emmanuel of Sardinia.

VILLARI (vēl'la-rē), Pasquale, historian, born at Naples, Italy, October 3, 1827. He studied law at the University of Naples, but was forced to leave the country for taking part in the revolutionary movement of 1848-1849. Subsequently he studied and resided at Florence, and in 1859 became professor of history in the University of Pisa. For several years he was general secretary of public instruction, was chosen deputy in 1867, and became senator in 1884. He was minister of public instruction from 1891 to 1892, in which capacity he gathered material for a number of reports, and subsequently devoted his attention mainly to historical writings. Among his works are "First Two Centuries of Florentine History" and "Life of Girolamo Savonarola."

VILLARS (vė-lär'), Claude I-ouis Hector, eminent military leader, born in Moulins, France, May, 8, 1653; died in Turin, Italy, June 17, 1734. He was the son of the Marquis de Villers and, after studying at the College of Juilly, entered the army as a volunteer. His first services in Holland were under Louis XIV., and he soon became distinguished as a gallant soldier. Later he served under Condé and Turenne in Germany, where he was made commander of a troop of horsemen in 1674. He was promoted to the rank of lieutenant general in 1693, and represented the French at the court of Vienna from 1686 until 1701. In 1702 he was sent to cooperate with the Elector of Bavaria in the War of the Spanish Succession and on Oct. 14 of that year defeated Prince Louis of Baden at Friedlengen, receiving for his services promotion to the marshalship. In 1703 he defeated the Prince of Baden at Hochstadt and soon after captured a number of towns in Germany. He was sent to supersede Vendome in Flanders in 1709, and was seriously wounded at the Battle of Malplaquet against Eugene and Marlborough. His successes in 1712 at Denain and Landrecies hastened the Peace of Utrecht, in 1713, and his series of successes against Eugene brought about the Peace of Rastadt in 1714. When the war with Austria was renewed, in 1733, he was made marshal general of France and sent into Italy with a large army. His death occurred while on his return to France after a successful campaign. Villars ranks as one of the greatest generals of the age of Louis XIV.

VILLEIN (vil'lin), the name of a particular kind of feudal serf, who occupied a middle position between the freeman and the menial serf. Some writers call all the peasants of the Middle Ages, whether free or unfree, villeins. According to others, all free peasants were termed villeins to distinguish them from those bound to the soil. The term had a local significance in some sections, where the villein occupied a portion of land at the will of the landlord, but he was required to perform menial labor. Usually the villeinage descended in regular succession from father to son, but later the villeins were permitted to occupy the lands only as a consideration for performing work in a satisfactory manner. After the serfs of this class acquired their freedom, they still continued their services as a condition of the tenure, but they came to be known as half or full villeins according to the size of the plat of ground held by the individual. The former had reference to about fifteen and the latter to thirty acres, while a tract of 120 acres was known as a hide. See Serf.

VILLI (vĭl'lī), the small conical projections of the mucous membrane of the small intes-They contain some muscular fibers and each villus has an artery, a vein, and one or more capillaries. The function of the villi is to absorb the nutritious matter from the digested food, which is taken up by the lacteals situated immediately back of the villi. The lacteals, during intestinal absorption, become distended with a whitish or bluish fluid called chyle. Small tubes run from each villus into larger ones lying in the mesentery. These tubes terminate in firm roundish bodies called mesenteric glands. Threadlike tubes lead from these glands to a larger tube, the thoracic duct, situated in front of the vertebral column. This duct is from eighteen to twenty inches long, has numerous valves opening toward the neck, and discharges into the left subclavian vein.

VILLIERS (vĭl'lērz). See Buckingham.

VILNA (vil'na), a city of Russia, in the government of Vilna, about 470 miles southwest of Saint Petersburg. It has good railroad facilities. is surrounded by a fertile farming and

dairying country, and is the center of a large trade in grain, live stock, and timber. The chief buildings include the Cathedral of Saint Stanislaus, the Cathedral of the Holy Virgin, the Church of Saint Nicholas, the city hall, the public library, the university, and several synagogues. The university has a fine museum of antiquities, an observatory, and botanical and zoölogical gardens. Among the principal manufactures are leather, soap, earthenware, farming implements, lumber products, clothing, and machinery. The streets are paved substantially. They are lighted with gas and electricity and traversed by electric street railways. The municipality has extensive systems of waterworks and sewerage. Vilna was founded in the 10th century and was annexed to Russia in 1795. It was captured by the Germans in 1915. Population, 1915, 198,680.

VINCENNES (vĭn-sĕnz') a city of Indiana, county seat of Knox County, on the Wabash River, 100 miles southwest of Indianapolis. It is on the Baltimore and Ohio Southwestern, the Evansville and Terre Haute, the Cleveland, Cincinnati, Chicago and Saint Louis, and other railroads. The surrounding country is fertile, producing grain, hay, and vegetables. Among the noteworthy buildings are the county courthouse, the high school, the public library, the Vincennes University, the Cathedral Library, and the Saint Rose Female Academy. The manufactures include furniture, flour, farming implements, woolen goods, clothing, machinery, and earthenware. It has a growing trade in cereals, live stock, and merchandise. Vincennes is the oldest city of Indiana. It was settled in 1702 by the French. From 1801 to 1816 it was the capital of Indiana. It was chartered as a city in 1856. Population, 1910, 14,895.

VINCENT (vin'sent), John Heyl, clergy-man and author, born in Tuscaloosa, Ala., Feb. 23, 1832. After attending the academies of Lewisburg and Milton, Pennsylvania, he studied at the Wesleyan Institute, and soon after was given a pastoral charge in Illinois. In 1865 he established the Sunday-School Quarterly and the following year founded the Sunday-School Teacher, the latter containing his modern lesson system, which has since become international. Vincent was one of the chief organizers of the Chautauqua Assembly. He became editor of the Sunday school and tract publications of the Methodist Church in 1868 and was elected bishop at the general conference in 1888, with his residence at Topeka, Kan. In 1900 he was made resident bishop in Europe, with his episcopal residence at Zurich, Switzerland. His publications include "Studies in Young Life," "Chautauqua Text-Books," "The Story of a Letter," "My Mother," and "The Earthly Footsteps of the Man of Galilee."

VINCI (vǐn'chê), Leonardo da, famous painter and sculptor, born near Florence, Italy, in 1452; died near Amboise, France, May 2,

1519. He was the son of Pietro da Vinci, a notary of Florence, and was distinguished as a student in mathematics, literature, botany, and physics. His natural skill in the arts of design caused his father to place him in the studio of Andrea del Verrocchio, a painter and sculptor, whom he soon surpassed. The Duke of Milan employed him in 1482 for artistic work and engineering, and while at Milan he frescoed "The Last Supper," a fine production in a Milanese convent. In 1499 he visited Florence, where he painted his famous portrait known as "La Gioconda," now in the Louvre of Paris. The Pope made him chief engineer and architect of the army in 1502, in which capacity he visited and inspected many of the fortified places in the papal states. He returned to Milan in 1507, where he painted the "Madonna and Child." In 1516 he accompanied Francis I. as court painter to France. Among his best known achievements are an equestrian statue of Francesco Sforza, the designs for the canal of Martesana, at Milan, and portraits of a number of distinguished sovereigns. "The Adoration of the Kings" is one of his finest paintings. Vinci was one of the most learned men of his times, as well as a noted painter and sculptor. The casket containing his remains was placed in the palace of Amboise in 1874, under the protection of the Count of Paris.

VINE. See Grape.

VINEGAR (vin'ê-ger), an acid liquid obtained from an alcoholic liquid, usually cider or wine, used as a condiment and a preservative. In countries producing large quantities of wine, it is obtained from inferior grades of wines by acetous fermentation, but it is produced largely from malt. Malt vinegar contains four to six per cent. of acetic acid. It has a reddish-brown color and is quite highly esteemed. Crabs or sour apples are used largely in the manufacture of vinegar, but the product has neither the strength nor the flavor of the product made from wine.

Large quantities of cider vinegar, a grade deemed best in general household use, are made in the cider districts, especially in the regions growing large quantities of apples, pears, and peaches. Sugar is usually added to a very acid cider, thus giving the product a finer flavor and a less acid taste, but the cider made of a better grade of fruit is simply the fermented juice. The processes of making cider from fruit and malt are quite similar, the expressed juices being placed in casks about three-quarters full and exposed to the air at a temperature of about 70°. If the proper amount of air and warmth, two essential conditions, are supplied, fermentation takes place rapidly. After the vinous fermentation has taken place, the vinegar is filtered, cleared, and drawn off into casks.

White vinegar is made by distilling either malt or wine vinegar and has about the same essential principles as the vinegar from which

3051

it is derived, but contains four to seven per cent. of acetic acid. German vinegar is made by passing malt or fermented wort over wood shavings in the presence of air. Vinegar may be obtained from all liquids which are capable of undergoing vinous fermentation. The cereals used extensively at present include rye and corn, a bushel of the latter yielding about four gallons of vinegar. The leading vinegar-producing region includes Missouri, New York, Ohio, Pennsylvania, Michigan, California, and Ontario. Vinegar is adulterated by adding sulphuric and sulphurous acids, which may be detected by boiling a quantity to which chloride of calcium has been added.

VINLAND, or Wineland, the name applied to that part of North America which was visited by the Vikings of Norway. In 986 this region was visited by Bjarne Herjulfson while on his way to Greenland, and Leif Ericson made an expedition to it in the year 1001. He named the country Vinland, owing to the abundance of wild grapes found at the time. It is not certain to what region the name has reference, but it is usually applied to the coast lying between Delaware and Nova Scotia. Some writers applied the name Vinland in particular to New England, while Nova Scotia is termed Markland and Newfoundland is called Helluland. These three names appear to have been applied by Leif Ericson to regions corresponding to the sections mentioned. Remains of an old mill at Newport and the Dighton Rock have been assigned in popular belief to the Norsemen, who are supposed to have formed settlements in America, but it is more probable that the former was erected by early English settlers in Rhode Island and that Indians located and inscribed the latter.

VINTON (vin'tun), Alexander Hamilton, clergyman and author, born in Providence, R. I., May 2, 1807; died in Philadelphia, Pa., April 26, 1881. He was the brother of David Hammond Vinton (1803-1873), an American soldier of the Mexican and Civil Wars. After studying at Brown University, he pursued a course at the Yale Medical School, and practiced his profession at Pomfret until 1832. He took up the study of theology at the Protestant Episco-pal Seminary, New York, and successively filled pastorates in Portland, Boston, Philadelphia, and New York City. His chief publication is "Lectures on Evidences of Christianity."

VIOL (vī'ŭl), an ancient stringed musical instrument, the forerunner of the modern violin. It was constructed similar in shape to the violin and was furnished with six or more strings, the tones of which were regulated by being brought into contact with frets placed at regular intervals along the neck, for which purpose the fingers were used as in the violin. A bow was used to play the instrument. Three kinds of viols were in use, known as the treble, the tenor, and the base. The last mentioned was sometimes called viol da gamba, from the fact that it was held between the legs of the performer. It has been superseded in modern times by the violoncello.

VIOLET (vī'o-let), a large genus of herbaceous plants, which are found in most parts of the globe, including about 200 well-marked spe-

cies. The species native to North America are usually low herbs, either stemless, as the common blue violet and the bird's-foot violet, or with short leafy stems, as the dogtooth violet, and the Canada violet. The flowers are solitary, or rarely in pairs, growing at the end of slender axillary flower stalks. Most species



COMMON BLUE VIOLET.

have flowers of irregular form, with five sepals prolonged at the base and five petals, the larger one occurring at the lower part and provided with a spur. Many of the violets are blue, and the typical violet of literature is always so. Some have fine fragrance and some are scentless. The species range in shades from the deepest blue to yellow and white. The common sweet violet and the violet tricolor are popular species and are grown extensively in gardens. Others include the hooded violet, larkspur violet, and leafy-stemmed violet. The pansies grown in flower gardens are a variety of the violet tricolor and are obtained by propagation. They are generally popular for cultivation in gardens.

VIOLIN (vī-ō-lĭn'), the most important modern stringed instrument of the viol class, having four strings of catgut. It is played with a bow. The lowest string is covered with silver-copper wire and the bow is strung with horsehair. A hollow wooden body, usually of pine, maple, or sycamore, forms the larger part of the instrument, and to it is attached a solid wooden handle or neck. The strings are fastened to a tailpiece at one end of the chest or body, passing over a small wooden or bone bridge, and kept in tune and position by a series of keys at the end of the neck. Two f holes, so called from their similarity to the shape of that letter, are cut in the upper side of the body. The hairs of the bow are charged with rosin, thus producing the sound as the bow is drawn across the strings. The different notes of the musical scale are produced by stopping the strings with the fingers of the left hand against the finger board on the handle, thus shortening the vibrating portion. Nearly all the different parts of violins are fastened together with glue. It is noteworthy that the finest violins were made about 200 years ago, and some of them have a value at present ranging from \$1,500 to \$3,000.

Various characteristics of a violin determine the quality of its tone, including the varnish,

the fineness and thinness of the wood, the sounding holes, the curvings and arches, and the seasoning of the materials. The precise cause of the superiority of the older instruments has never been satisfactorily explained, neither has it been possible to construct instruments either equal or superior to them. Violins of the highest quality come from Italy, especially from Cremona, Milan, Venice, Brescia, and Mantua. Stradivarius, a native of Cremona, was the greatest

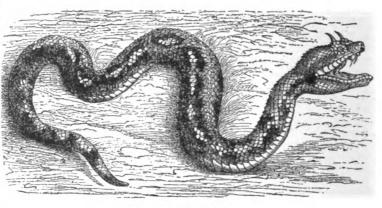
of all violin makers. Jacobs, Klotz, and Stainer were the most eminent among the Germans, Vuillaume among the French, and Fox and For-

rest among the English.

The violin originated from the viol, a stringed musical instrument of the Middle Ages, having from five to seven strings and being played with a bow. It was considerably smaller than the violin and resembled the guitar in having the finger board divided by frets. An instrument larger than the violin, but resembling it, is called a violoncello. The Anglo-Saxons called the violin a fythel, hence it is frequently called a fiddle. The climate of Italy is especially adapted to the making of excellent violin strings, but the largest manufactures of violins are now in Germany and France. Among the eminent players on the violin are Schnittelbach of Lübeck, Louis Spohr (1784-1859), Ole Bull (q. v.), and Luigi Boccherini (1740-1806)

VIOLONCELLO (vē-ð-lŏn-chĕl'lð), a musical instrument of the violin family, which ranks immediately between the viola and the double base, being an octave lower than the former and an octave higher than the latter. The performer holds the instrument between the knees. It has four strings, the two lowest covered with silver wire, and is played upon by a bow. The instrument is tuned in fifths, A, D, G, and C, and is eminently rich and expressive in tone.

VIPER (vī'pēr), a venomous serpent native to the Old World, including two or three species which differ slightly in color. The appearance is similar to the rattlesnake of America, but there are no rattles on the tail, and they have no teeth in the upper jaw aside from the two hollow poison fangs. The best known species include the common viper, or adder, of Europe; the horned viper, or asp, of Africa; and the Russell, a small viper of India. In Western Europe the common viper is the only poisonous snake. It has a brownish-yellow color, marked



HORNED VIPER.

with black triangular spots, and its bite is not specially fatal, but it is quite painful and frequently produces fever and sickness. Vipers are viviparous animals, their eggs remaining within the body until fully incubated. Most species are good swimmers, but they generally inhabit dry woods and heaths. They feed on small birds, frogs, mice, and insects. The common viper of Europe is about two feet long, but the species native to India attain a length of five to six feet. The black viper of North America is an allied species.

VIRCHOW (ver'chou), Rudolf, pathologist and author, born in Schivelbein, Germany, Oct. 13, 1821; died Sept. 5, 1902. He studied

in his native town and entered the University of Berlin, where he graduated as a medical student in 1843. He was soon after made lecturer on anatomy at the University of Berlin, but, entering the political arena as a leader of



RUDOLF VIRCHOW.

the liberal party, he was deprived of his lectureship by the government in 1849. In the

same year he was called to the chair of pathological anatomy in the University of Würzburg, where he labored with remarkable success until 1856, when he was recalled to his former position in the University of Berlin and made director of the Pathological Institute. He was elected to the Reichstag in 1880, serving on a number of important commissions, and was noted as a political opponent of Bismarck. In 1888 he treated Frederick III., who was afflicted with a cancerous disease, and thus became known to the world as an ultimate authority on pathology. His policy in government was directed with the view of aiding the laboring and industrial classes.

Virchow attained eminence by traveling in Asia Minor, Nubia, and Egypt, partly in company with Schliemann, and published a number of excellent works on anthropology. Among the distinguished honors bestowed upon him are memberships in the London Royal Society of Medicine in 1856, in the French Academy of Medicine in 1859, and in the Berlin Academy of Sciences in 1873. His "Cellular Pathology" is one of his most important works and has gone through many editions and translations. Other publications include "On Post-Mortem Examination," "Freedom of Science in the Modern State," "Alimentation and Well-Being," "Collection of Treatises on Scientific Medicine," "Lectures on Life and Illness," "Function of Science in the New National Life of Germany,' "Treatise on the Theory of Trichinae," "Goethe as a Naturalist," and "Lectures on Pathology."

VIREO (vĭr'ē-o), or Greenlet, a family of insect-catching birds. They are restricted to the American continent and range from Canada to Paraguay. About sixty species have been enumerated, including many birds of rare plumage and beautiful song. The representative species are about six inches long, with an alar extent of ten inches. The predominating color is dull green and yellowish, the bill is conical, and the nostrils are overhung by mem-They build their cup-shaped nest of tough fiber of the inner bark of plants, instead of the more brittle grasses, and suspend it from the twigs of bushes and trees. The nest is lined with soft materials, such as wool and soft grasses, and the parts are carefully glued together with saliva. Most species are migratory, visiting the higher latitudes in May and returning in the fall to the tropical regions. The species common to Canada and the United States include the warbling vireo, the redeyed vireo, the yellow-throated vireo, the blueheaded vireo, and the white-eyed vireo.

VIRGIL (ver'jil), Publius Virgilius Maro, famous Roman poet, born near Mantua, in Northern Italy, Oct. 15, 70; died in Brundusium, Sept. 22, in the year 19 B. c. He was the son of a small landowner, who tilled a farm on the banks of the Mincion, in the district of Andes. The scenery with which he came in con-

tact in early life inspired him in many of his poetical productions. His father recognized his natural ability and devotion to study and gave him the advantages of a careful education. It

is possible that his diligence in study was enhanced by the fact that he was not a Roman citizen by birth, thus checking any aspirations he might have formed to become eminent as a soldier, orator, or statesman. He first studied at Cremona and Milan, but in 55 became a student of Greek and philosophy under Syron in Naples.



VIRGIL

It appears that Virgil returned to his father's farm with the view of devoting his life to poetry and agriculture, but, as Mantua had sympathized with the opponents of Antony and Octavius, the lands were confiscated after the Battle of Philippi in 42 B. c. However, he succeeded in recovering his estate by reason of friendship with Asinius Pollio, the Roman governor, and soon after formed the acquaintance of Octavius. When the latter became Augustus, after the Battle of Actium, in 31 B. c., the poet was remembered by the distinguished Roman sovereign. He resided for some time at Rome, where he formed a firm friendship with Varro, Maecenas, and Horace, but spent most of his life in retirement, after 37 B. C., on his estate near Naples, where most of his famous writings were completed. The larger part of his great work, the "Aeneid," was written before 19 B. c., but in that year he went to Athens with the view of revising the poem in some particulars, and while there Augustus returned from the East. The latter persuaded him to sail in his company to Italy, but the strain of exposure at sea caused his delicate constitution to fail and he died at Brundusium, shortly after reaching Italy. His body was placed in a tomb at Naples, which was long visited with sacred reverence by many Romans.

The fame of Virgil rests on three celebrated works, entitled the "Eclogues," the "Georgics, and the "Aeneid," though the last mentioned is considered the most remarkable. The "Eclogues," comprising ten poems, were written about 40 B. C. Though devoted largely to poems of a pastoral character, they include many allusions to the current political events. The "Georgics," a work properly regarded the most highly finished of Virgil's poetry, are addressed to Maecenas and probably were written at his suggestion. They treat of agriculture as connected with the life and times of the author. Four volumes make up the "Georgics," in which is given a poetic description of the culture of the vine and other fruits, the rearing and care of domestic animals, and the care of bees. They include a fine presentation of the climatic conditions of Italy and the changes of weather, and include a description of the appearance of the firmament in

northern Italy.

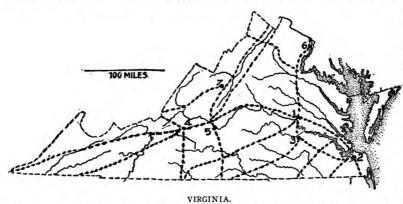
The "Aeneid" is in twelve books, the first six being modeled after the "Odyssey," and the last six after the "Iliad." Virgil makes Aeneas the subject of this remarkable work. He is represented as fleeing from Troy, after that city had fallen under the attacks of the Greeks, and after many adventures he lands in Latium, where he becomes the husband of Lavinia, daughter of King Latinus, and, after subduing his enemies, he lays the foundation of the Roman nation. Though a work of refinement of expression and elegant construction, it is inferior to the Homeric poems. It was not wholly completed to his liking at the time of his death, and he preferred to destroy rather than leave it in an incomplete condition, but Augustus prevailed upon him to intrust the revision of the work to his friends, Varro and Tuacca. These writers edited it with great care, and it is possible that a number of interpolations were made. The Romans regarded him with religious veneration, and he impresses modern readers as one who lived in a much higher sphere than his contemporaries. Many translations have been made from Virgil, the best in the English being by William Morris and the best in the German by Richard Wagner.

VIRGINIA (ver-jin'i-à), one of the original thirteen states of the United States, popularly called the Old Dominion. It is bounded on the

Atlantic coast plain, which includes the tidewater country and a portion of the Piedmont plain. In the western part are ranges of the Appalachian highlands, with summits that approximate altitudes of 5,700 feet. There is a general rise toward the northwest, the eastern part being low and more or less undulating, but rising in a series of belts until the highlands are reached. The tidal shore line, which is about 1,500 miles long, rises from a few feet to fully 75 feet above sea level. Among the mountain ranges of Virginia are the Blue Ridge, the North Allegheny, the Clinch, and the Cumberland mountains. Rogers Mountain, on the western border, has an elevation of 5,719 feet and is the highest summit in the State. The Cumberland mountains form the boundary between Virginia and Kentucky, and immediately west of the Blue Ridge is the famous valley of the Shenandoah. This valley is bounded on the west by the Alleghenies, in which are numerous limestone formations, including the famous Natural Bridge.

The greater part of the drainage belongs to the Atlantic coast plain. On the border between Virginia and Maryland is the Potomac, which drains the northern and eastern section of the State. It receives the inflow from the South Branch and the Shenandoah and flows into Chesapeake Bay by an extensive estuary. Among the streams that drain directly into Chesapeake Bay are the Rappahannock, the York, the Mattapony, and the James, which receives the inflow from the Appomattox. The Staunton

flows into the Roanoke, which crosses the line into North Carolina and discharges into Albemarle Sound. About one-seventh of the State is drained by the Great Kanawha, the Holston, and the Clinch rivers into the Mississippi system. Deep gorges and numerous waterfalls characterize the rivers that flow through the mountainous section, and the streams that ward the east have



1, Richmond; 2, Norfolk; 3, Petersburg; 4; Roanoke; 5, Lynchburg; 6, Alexandria; 7, Staunton. furnish drainage to-Chief railroads are shown by dotted lines.

north by West Virginia and Maryland, east by Maryland, Chesapeake Bay, and the Atlantic Ocean, south by North Carolina and Tennessee, and west by Kentucky and West Virginia. In shape it is a triangle, the apex being in the north. The southern boundary is a straight line 438 miles long, and the greatest breadth from north to south is 192 miles. It has an area of 42,450 miles, which includes 2,325 square miles of water surface.

DESCRIPTION. The eastern part belongs to the

escarpments to which navigation extends in the larger rivers. A portion of the State lies east of Chesapeake Bay and is organized into the two counties of Accomac and Northampton.

The climate is generally healthful, though sudden changes in temperature are frequent in the northwestern part. In the highlands the summers are cool and pleasant, but the higher altitudes have cold winters. The extremes in temperature range from 8° below zero in winter to a summer heat of about 98° in July. In the

eastern part the climate is much warmer and more uniform. Here the thermometer seldom falls below 10° and the maximum heat of summer is from 98° to 104°. All parts of the State have an abundance of rainfall, which ranges from 48 inches in the eastern part to about 35 inches in the Shenandoah Valley. Snowfall is abundant in the higher altitudes, but disappears

on the early approach of spring.

MINING. The mineral deposits consist chiefly of coal and stone. At present about 4,825,000 tons of coal are produced annually, being a material increase the last five years. A large part of the product is used in manufacturing coke. Iron takes rank as the principal metal, and the output in tons is about one-eighth that of coal. Limestone, granite, gravel, and clays are abundant. Slate of a good quality is quarried in the Piedmont plain, and the mines of anthracite and bituminous coal are chiefly in the western part. Mineral waters obtained in Virginia yield large returns. Other mineral products include salt, ocher, lead, gold, silver, gypsum, manganese, zinc, and precious stones.

AGRICULTURE. Fully 78 per cent. of the area is included in farms, which average 118 acres. In the production of peanuts the State usually holds first rank. Corn is the leading cereal and the most important crop. It is followed in acreage by wheat, hay, and oats. Large interests are vested in the cultivation of tobacco, and a fine grade known as Virginia Leaf is exported extensively. Other crops include rye, buckwheat, cotton, peas, potatoes, sweet potatoes, and fruits. Vegetables of all kinds are cultivated extensively for the early markets in the North.

The interests in stock raising have grown without intermission through every decade since the Civil War. This circumstance is accounted for by the fact that the farmers appreciate the utility of mixed farming as a means of maintaining the fertility of the soil. The largest investments are represented by the cattle industry, both in the production of meat and the dairy products. Horses of a good grade are grown for domestic use and for export. Other farm animals include sheep, mules, swine, goats, and poultry. The better class of grazing land is in the western part, where clover and blue grass flourish.

Manufactures. Noteworthy progress has been made in the quantity of the manufactures produced within the last decade. The output has more than doubled in value within the last twenty years. This is accounted for by the fact the State has much material to promote this enterprise, such as coal, iron, cotton, tobacco, lumber, and cereals. Tobacco products stand at the head of the list. They are followed closely by the output of flour and grist-mill products, lumber and timber products, and the manufactures derived from foundries and machine shops. Tanning is an extensive enterprise, owing to a

large supply of oak bark within the forests of the State. Among the general manufactures are coke, canned fruits, cotton and woolen goods, cured and canned fish, spirituous liquors, quarry product, machinery, locomotives, railway cars, and farming implements. The oyster industry of Chesapeake Bay is an important factor among the industries. Richmond and Norfolk are the leading manufacturing cities.

TRANSPORTATION AND COMMERCE The Atlantic Ocean and Chesapeake Bay afford fine harbors, and the rivers that discharge into the latter have extensive tide-water estuaries. One of the finest harbors along the Atlantic coast is on Hampton Roads, at the entrance of the James River into Chesapeake Bay. The State has 4,950 miles of railroads. Among the principal lines are the Chesapeake and Ohio, the Southern, the Atlantic Coast Line, the Baltimore and Ohio, the Norfolk and Western, and the Seaboard Air Line. Additional transportation facilities are provided by the James River, the Dismal Swamp Canal, the Kanawha Canal, and the Albemarle and Chesapeake Canal. State has a large interior and ocean trade. Among the leading exports are tobacco, coal, cotton, fruits, iron, vegetables, and manufac-

tured products.

GOVERNMENT. The present constitution was adopted in 1902. Executive authority is vested in the governor, lieutenant governor, secretary of State, treasurer, and auditor, each elected for four years by popular vote, except the auditor, who is chosen by the Legislature. Other State officials, including the superintendent of public instruction, are appointed either by the Governor or by certain boards and commissions. The Legislature consists of a senate and a house of delegates, the former chosen for four and the latter for two years. Membership in the senate cannot be less than 33 or more than 40, while the delegates in the house are limited to not less than 90 or more than 100. The supreme court of appeals consists of five judges and the State is divided into judicial districts, each of which has a judge elected for eight years. Lower courts, including justices of the peace, are chosen in the towns and cities. Local government is under the administration of the towns, cities, and counties.

EDUCATION. The public school system maintained at present was established in 1870, when ample provisions were made for the education of youth. A superintendent of public instruction, who is elected by the General Assembly for four years, has control of the educational work. but is assisted as a member of the board of education by the Governor and the Attorney-General. This board has been an important factor in enlarging the educational facilities, since it has general supervision of the school fund and may remove, with the consent of the senate, any county or city superintendent. All the schools, except the primary departments, are required to

be in session at least five months. Although separate schools are maintained for white and colored children, all have equal educational privileges. Illiteracy among whites is reported at 11.1 per cent. and among colored inhabitants at 44.6 per cent., but these figures are based on the population of ten years of age and upward.

Virginia has a large number of institutions of higher learning, some of which have been noted from an early date in the history of the country. Foremost among these are the University of Virginia, at Charlottesville; the College of William and Mary, at Williamsburg; the Richmond College, at Richmond; and the Washington and Lee University, at Lexington. Other institutions of higher learning include the Emory and Henry College, at Emory; the Randolph-Macon, at Ashland; the Virginia Union University, at Richmond; the Roanoke College, at Salem; the Hampden-Sydney College, at Hampden-Sydney; the Bridgewater College, at Bridgewater; the Saint John's College, Tidewater; and the Virginia Medical College, at Midland. Normal instruction for teachers is provided at the State Female Normal School, at Farmville; the Virginia Normal and Collegiate Institute, at Petersburg; the College of William and Mary, at Williamsburg; and the Hampton Normal and Agriculture College. Staunton has an institution for the deaf, dumb, and blind. Laurel is the seat of an industrial reform school for white boys. Insane asylums for whites are located at Marion, Staunton, and Williamsburg. Petersburg has an insane asylum for Negroes. The State penitentiary is situated at Richmond, which city likewise has a soldiers' home. A State farm is maintained to employ convicts, this enterprise having proved very satisfactory.

Inhabitants. Virginia has a small number of foreigners, only 19,461. There has been a noticeable increase in the urban population, owing to the material advancement in manufacturing enterprises. Richmond, on the James River, is the capital and largest city. Other cities include Norfolk, Petersburg, Roanoke, Newport News, Lynchburg, Portsmouth, Danville, Alexandria, Manchester, and Staunton. In 1900 it had a total population of 1,854,184. This included 660,722 Negroes. Population, 1910, 2,016,612.

HISTORY. Virginia was so named in honor of Queen Elizabeth, the virgin queen. The colonial history is of remarkable interest, especially because of its prominent connection with the early development of America. Sebastian Cabot explored its shores in 1498 and Verrazano visited the region in 1524. Sir Walter Raleigh subsequently surveyed the coast, and a grant of the land was made to the London Company in 1606. The first permanent settlement of the English in America was made at Jamestown on May 13, 1607, and here also met the first representative assembly. Negro slavery was introduced in 1619, when a Dutch man-of-war brought twenty slaves to the colony, and afterward a large slave

trade was conducted by the English. Virginia was prominent in protesting against the legislative measures of Great Britain, especially the Stamp Act, and furnished such noted men as Jefferson, Washington, Madison, the Lees, and Henry in the Revolutionary period. It was a noted battle ground of the Revolution. At Yorktown, on the York River, occurred the surrender of Cornwallis in 1781.

Many citizens of Virginia supported the Union in the War of 1812 and the Mexican War of 1846-1847. In 1859 John Brown made his famous raid at Harper's Ferry, but the citizens of the State did their utmost to avoid the Civil War by calling a peace convention. An ordinance of secession was finally passed on April 27, 1861, which was ratified by a popular vote on May 23, 1861. Richmond was the capital of the Southern Confederacy and the State was the scene of many great battles, thus causing it to suffer more than any other State in the armed contest. Lee surrendered on Virginia soil, at Appomattox Court House, in 1865, and the State was readmitted Jan. 26, 1870. Since the war it has increased rapidly in wealth and population. The constitution adopted in 1902 has for its purpose the reform of elections, limiting the right of franchise somewhat. In 1907 the Jamestown Tri-Centennial was held at Norfolk, near the mouth of the James, to commemorate the first English settlement in America. Seven natives of Virginia have become President of the United States.

VIRGINIA, a city of Minnesota, in Saint Louis County, 54 miles northwest of Duluth. It is on the Great Northern, the Duluth and Iron Range, and other railroads, and is surrounded by a productive iron-mining country. The principal buildings include the public high school, a number of churches, and many business and office buildings. It has a large trade in merchandise and lumber. Extensive interests are vested in machine shops and industries connected with mining and shipping iron ore. Electric lights, sewerage, and a system of waterworks are among the public utilities. Population, 1905, 6,056; in 1910, 10,473.

VIRGINIA, University of, an institution of higher learning at Charlottesville, Va., the home of Thomas Jefferson, who founded it. The institution was chartered in 1819 and opened for instruction six years later. It maintains departments of law, medicine, agriculture, academic instruction, and engineering. In addition it has a number of closely affiliated schools. The property under its control has a valuation of \$1.375,000, and the library contains a fine collection of 60,000 volumes. It has a faculty of 100 members and an attendance of about 1,000 students. Until 1904 the chairman of the faculty was the chief officer, but in that year Edwin Anderson Alderman was elected to the presidency

VIRGINIA CITY, a city of Nevada, county

seat of Storey County, 52 miles southeast of Reno, on the Virginia and Truckee Railroad. It was long noted as the largest and most important of the State, but subsequently declined in population. The noteworthy buildings include the county courthouse, the high school, the Miners' Union Library, and many fine churches. It has systems of electric lighting, waterworks, and sanitary sewerage. The famous Comstock mines are near the city. It was first incorporated in 1864. In 1890 it had a population of 8,511; in 1900, 2,695; and in 1910, 2,244.

VIRGINIA CREEPER, a plant of the vine family, which climbs by rootlets as well as by disc-bearing tendrils. In some regions it is called American ivy and woodbine. It differs from the poison ivy in having five-parted leaves, while the latter has three-parted leaves. greenish flowers are not conspicuous and are followed by dark blue berries, while the leaves assume a bright scarlet color in autumn. The plant is cultivated as an ornamental creeper on the fronts of houses, old walls, and over lattice work, its growth often reaching heights of thirty to fifty feet. An allied plant has been introduced from Japan, but is less hardy in the northern part of the United States and Southern Canada. It has three-lobed leaves, which densely cover the walls of buildings.

VIRGIN ISLANDS, an island group of the West Indies, lying east of Porto Rico and comprising about 35 islands. They are of volcanic origin, but the soil is generally fertile and the climate is similar to that of Porto Rico. Among the principal productions are sugar, salt, ginger, molasses, rum, cotton, turmeric, and many varieties of fruit. Saint Thomas, Saint Croix, and Saint John are the most important. islands since 1917 belonged to the United States; area, 118 sq. mi. Virgin Gorda, Anegada, and Tortola, being British, are governed from the colony of the Leeward Islands. Roadtown, on the south side of Tortola, is the capital and seat of local government. The British possessions have an area of 55 square miles and a population of 5,612. Columbus discovered the group, in 1494, and Tortola has been British since 1666. The entire group has an area of 270 square miles and a population of 43,688.

VIRGINIUS (ver-jin'é-us), Lucius, Roman centurion, famous for slaying his daughter to prevent her coming under the influence of Appius Claudius Crassus. Writers have made the story a favorite theme in literature, including Lessing, Leclerc, and Macready.

VIRGINIUS MASSACRE, the name given to the capture of an American merchant vessel by the *Tornado*, a Spanish man-of-war, on Oct. 31, 1873. The *Virginius* was employed in conveying arms and men to aid the Cubans in an insurrection, which was the cause of the capture. Four Cubans were found on board and were immediately executed, along with Captain Frye and 52 persons, including the crew and passen-

gers. The Spaniards released the vessel and the passengers who were permitted to live. Those on board started for New York City, but the boat was abandoned off Cape Fear. This incident caused considerable trouble, but diplomatic negotiations were instrumental in averting war.

VIRGIN MARY. See Mary.

VIRUS (vi'rus), the name applied in medicine to fluids produced by diseased conditions or morbid processes in animals. In popular use the term is applied to the lymph used in vaccination, but physicians restrict it to the fluids that arise in such diseases as smallpox and measles. Virus is capable of developing disease when transmitted to other animal bodies.

VISE, a tool that has two jaws constructed so as to hold tight any material while work is done upon it. The jaws are fitted with a screw or lever, by which the movable jaw may be pressed tightly against the fixed jaw, thus holding secure the material upon which work is to be done, as in filing. Carpenters, machinists, and others use vises in their workshops. See Screw.

VISHNU (vish'noo), the second person of the divine trinity of the Hindus, the complete trinity consisting of Brahma, the creator; Vishnu, the preserver; and Siva, the destroyer. He is mentioned in the early writings of the Vedas as a manifestation of the sun, but in the epic poems known as the "Rámáyana" and the "Máhábhárata" a higher rank is given him in the divine essence. His office is to preserve and to do this he his to make ten descents to earth, called avatars or incarnations. Nine of these have already occurred, but the tenth is still looked for with much confidence. His first descent was to warn the righteous king Manu to save the sacred Vedas from an approaching deluge; the second, to support the world while the sea was disturbed; the third, to raise the submerged world; the fourth, to destroy an impious king; the fifth, to restore supremacy of the gods; and the sixth, to wash away the sins of the world. The seventh appearance of Vishu was in the form of Rama, the hero of the "Rámáyana;" the eighth as Krishna; and the ninth as Buddha. It is held that the tenth appearance will be as Kalki, or the White Horse, when he shall destroy the wicked and vouchsafe bliss to the righteous. Vishnu is represented in painting and statuary as having four arms, holding in each hand some symbolic object. At other times he is shown seated on a throne, or as riding on a being in the form of half man and half bird. The worship of Vishnu is largely among the middle classes.

VISIBLE SPEECH, a system of symbols to represent the articulate utterances of the organs of speech. It is based upon an exhaustive classification of the possible action of the organs involved in speech. Since these organs are alike in all persons and the movements in uttering sounds are the same, visible speech is in the form of a universal language. Every letter in

OTHS

3058

the system of letters, as well as every modification of the different characters, has an organical significance. The purpose of visible speech is to enable people of different languages to become able to communicate with each other and to facilitate communication among the deaf and dumb. Visible speech is an entire revolution in the method of communication, since it consists in a form of writing, and is thus based upon the actual movement of the organs of speech. It was devised by Alexander M. Bell, who lectured and wrote extensively upon the subject.

VISIGOTHS (vĭz'i-gŏths). See Goths. VISION (vĭsh'ŭn). See Eye.

VISTULA (vis'th-là), a river of Europe, which rises in northern Austrian Silesia and flows toward the northwest into the Baltic Sea, its waters passing into the Gulf of Dantzic. It courses through western Poland and eastern Germany. The length is 675 miles, of which 550 miles are navigable. The Vistula has falls of 200 feet in Silesia. Among the chief cities on its banks are Cracow, Warsaw, and Dantzic. Its tributaries include the Bug, San, and Brahe. Canals connect it with the Oder, the Dnieper, and the Niemen.

VISUAL SENSATION, the name applied to the phenomenon of sight which causes the sensation upon the vision to be of greater duration than that of the stimulus. Such a sensation may be noticed in a flash of light, which lasts longer than the time occupied by the light vibration acting on the retina. A single sensation is occasioned when two flashes occur near each other. To prevent fusion in the case of a strong light, the interval between the two must be more than one-thirtieth of a second, while in a faint light it must be more than one-tenth of a second. This is due to the fact that it is easier to distinguish differences of brightness between two faint lights than between two of great brilliancy, as between a dip and a wax candle, on the one hand, and two bright electric lights, on the other. Many double stars seen with small telescopes appear as single ones, and that two stars exist can be proven only by the more powerful instruments. When the distance between two stars subtends an angle less than sixty seconds, most people see them as one. Sensations of color depend on the wave length of the rays falling on the retina in a given time, as well as on the amount of white light falling on the same retinal area at the same time. The colored light sensations are diluted by the white light. Red, green, and violet are the three primary colors which cause retinal sensations.

VITEPSK (ve'tyepsk), or Vitebsk, a city in Russia, capital of the government of Vitepsk, 342 miles west of Moscow. It is finely situated on the Duna River, has good railroad facilities, and is surrounded by a fertile farming and dairying region. The features include the city hall, the government house, the church of Saint Michael, and the Cathedral of Saint Nicholas.

Among the manufactures are tobacco products, furniture, sugar, and clothing. It has a large trade in farm produce, live stock, and timber. Formerly the place belonged to Poland, but it became a part of Russia in 1772. A large part of the inhabitants are lews. Population, 108,234.

VITORIA, or Vittoria, a city of Spain, capital of the province of Alava, 30 miles south of Bilboa, on the Zadorra River. A large part of the place is not well improved, having narrow and gloomy streets, but the newer section contains many fine buildings and charming plazas. Among the principal buildings are the city hall, the governor's palace, the poorhouse, and the Cathedral of Santa Maria de Vitoria. Formerly the inhabitants were dependent entirely upon local enterprises, such as the manufacture of earthenware, leather, woolen textiles, and malt liquors, but the construction of railroads has enlarged these enterprises and promoted a growing trade. Vitoria has figured more or less prominently in several wars, especially in 1813, when Wellington gained a decisive victory over the French at this place. Population, 1910, 32,377.

VIVISECTION (viv-i-sek'shun), the practice of cutting the living body of animals for the purpose of making physiological or pathological investigation. Vivisection on the lower forms of animal life has been the means of acquiring nearly all the knowledge we possess of the physiology of the human body. It was employed by Galen in 150 A. D., when he discovered that the artery contained blood instead of air as was formerly supposed. In 1628 William Harvey, by means of vivisection, learned that the blood passes from the heart through the arteries and returns again to the heart by means of the veins, in fact that the heart is the organ which propels the blood. Since that time vivisection has been employed very extensively, but it is condemned on the ground of cruelty in some countries, especially as sometimes practiced in the secondary schools.

Modern medical practice is based very largely upon the study of conditions of health and disease and the effect of medicine through vivisection. In most cases the operations are performed under anaesthetics, but where no cutting more severe than a superficial venesection is desired, the operations are done without anaesthesia. In 1907 the Royal Commission on Vivisection reported that 46,073 experiments were performed within that year in the United Kingdom, a majority of which were concerned in studying cancer, tuberculosis, rabies in dogs, and the effect of various drugs upon the heart and nerves. Vivisection is practiced extensively in the veterinary colleges in France and the United States, but in most countries a license is required from government officials to carry on such investigations.

VIZIER (viz'yēr), or Vizir, a title given to high officials in Mohammedan countries, es-

pecially in the Ottoman Empire. The term was first used as a title of the prime minister and was conferred by Amulath I. on General Timurtash in 1386. Now the grand vizier is the highest officer in Turkey, next to the Sultan. In Turkey he is known as the vizier-azam, or the sadr-azam.

VLADIMIR (vlad'i-mer), called The Great, first Christian Emperor of Russia. He became Prince of Novgorod on the death of his father, in 972, but succeeded to the sole government of Russia, in 980, and reigned successfully until his death in 1014. Though a heathen at the time he ascended the throne, he became converted to Christianity, and was received into the Greek Church by baptism at Constantinople in 988. Many benefits were bestowed upon Russia in his reign of 35 years. He built churches, established schools, reformed the civil service, and laid the foundation for a powerful nation in the northern part of Europe. The Russian Church

bestowed upon him the epithet of saint. VLADIVOSTOK (vla-dye-vas-tôk'), a city of Asiatic Russia, on the Gulf of Peter the Great, an inlet of the Sea of Japan. It is near the Corean frontier and forms the eastern terminus of the Trans-Siberian Railway. The harbor is well sheltered and commodious, ranging in depth from 30 to 75 feet, but the intense cold of winter makes it icebound for a number of months. The city is the chief naval station of Russia on the Pacific, having naval workshops and strong battery defenses, and its extensive transportation facilities make it a commercial center of importance. It has two naval schools and several institutions of secondary learning. The citizens maintain scientific and educational societies and excellent elementary schools. It is the seat of a number of churches and hospitals. Vladivostok is important as the center of extensive machine shops and dry docks. Among the manufactures are lumber products, utensils, cured fish, and implements. Population, 1918, 99,450.

VOGEL (fo'gel), Julius, statesman and journalist, born of German parents in London, England, in 1835; died March 13, 1899. He went to Melbourne, Australia, soon after the gold fields in Victoria were discovered, and, after engaging in business pursuits, became a journalist. Subsequently he removed to Dunedin, New Zealand, where he became a member of the local Parliament, and from 1876 to 1881 was agentgeneral in London. Vogel founded the first daily newspaper in New Zealand. He was knighted

in 1875.

VOGLER (fog'ler), George Joseph, organist and composer, born in Würzburg, Germany, June 15, 1749; died May 6, 1814. He studied at Bamberg and Mannheim and afterward proceeded to Rome, where he was ordained priest in 1773. Soon after he became a knight of the Golden Spur and was made chamberlain to the Pope. In 1775 he returned to Mannheim, where he became court chaplain, but soon after opened a school of music. In 1780 he made an extensive tour of Southern Europe. Later he visited remote districts of Asia and Africa, and subsequently traveled through the northern part of Europe. He was made kapellmeister to the King of Sweden in 1776. At Stockholm he founded a second music school and attained much fame by performances on an instrument called the orchestrion, a kind of organ invented by him. Louis I., grand duke of Hesse-Darmstadt, appointed him kapellmeister at his court in Darmstadt, in 1807, and paid him a princely salary. While at Darmstadt he opened his third and most famous music school, in which such celebrated musicians as Weber, Gansbacher, and Meyerbeer received instruction. Volger produced a large number of excellent compositions and exercised an extensive influence on the mu-

sic of Europe.

VOGT (fogt), Carl, naturalist, born in Giessen, Germany, July 5, 1817; died May 6, 1895. After studying chemistry at Giessen under Liebig, he pursued a course in medicine at Bern and afterward received lectures on natural history delivered by Agassiz. In 1847 he became professor of zoölogy at the University of Giessen, but his zeal in the Revolution of 1848 caused him to lose his position, and he was made professor of geology at the University of Geneva. That position he held until his death. Vogt exercised a wide influence in the study of natural sciences and is the author of a number of valuable works. He made an expedition to North Cape in 1861, and was chosen a member of the Swiss national assembly in 1878. His first writing was done in 1839, when he assisted Agassiz in preparing the first two volumes of "Natural History of Fresh-Water Fishes." The independent works of Vogt include "Studies in Geology and Petrifactions," "Physiological Letters," "Ocean and Mid-Ocean," "Essays on the Darwinian Theory," "Lectures on Man," "Descriptive History of the Mammals," "Voyage to Cape North," and "Political Letters to F. Kolb."

VOICE, the sound produced by the vocal organs of a man and nearly all higher vertebrate animals. The larvnx is the organ of voice in man. It consists of the expanded upper end of the trachea, or windpipe, and is connected with the hyoid bone or cartilage. An opening, the glottis, connects the larynx with the pharynx. Within the framework of the larynx are two thin, elastic bands, extending from front to rear, called the vocal cords. They are not really cords, but merely elastic membranes projecting across the opening. The membranes spread apart and leave a V-shaped orifice when not in use, and through it the air passes to and from the lungs. The edges approach each other when the cords are tightened, thus bringing them within one-hundredth of an inch of each other. When air is expelled or driven out through the glottis or opening between the vocal cords, they are

thrown into vibrations and cause corresponding vibrations in the current of air. It will be seen from this that sound is produced in the same manner as by vibrations of the strings of a violin or the tongues of an accordion, though the vocal cords are scarcely an inch long.

Vocal sound is made only when the cords are less than one-tenth of an inch apart, and the different tones of the voice depend upon the width of the opening and the tension of the cords. When the cords are short, tight, and closely in contact, the higher tones of the voice are produced, while the opposite conditions cause the lower tones. Loudness depends on the strength of the expiratory current, and quality depends chiefly on the physical structure of the cords. The female voice has a higher pitch than that of the male, this being due to the circumstance that the cords of the latter are longer. At about the age of fourteen years the larynx of boys enlarges and the cords grow proportionately longer and coarser; hence, the voice becomes about an octave lower and is said to change or break. The voice changes somewhat in old age, this being due to the muscles that move the cords losing their elasticity. Soprano, tenor, and baritone voices depend respectively on the length of the cords, but all voices are modified to some extent by the form of the throat, mouth, nose, teeth, and lips. While many animals have voice, man alone has speech, which differs from voice in that it is a modulated form through whose agency ideas are expressed.

Though commonly associated with voice, speech may be effected without the voice, as in whispering, which is speech without the employment of the vocal cords. It is effected principally by the tongue, teeth, and lips modifying the expiratory current. Lisping, stammering, and stuttering are due more largely to the organs that modify speech than to the vocal cords, especially stammering, which is caused by irregular action of the nerve centers. The faculty of speech is natural, but it may be greatly improved by careful exercise. Vowel and consonant tones make up the two classes of articulate sounds. The vowel sounds are generated in the larynx. They consist of pure vocal tones, modified by the pharynx, mouth, and lips, and attain a nasal quality when the back entrance to the nostrils is not closed. The consonants are formed above the vocal cords, labials being made by the lips, linguals by the tongue, and dentals by pressing the tongue against the teeth. The strength of the voice depends on the resonance of the chest, lungs, and larynx, as well as on the vibration of the vocal cords.

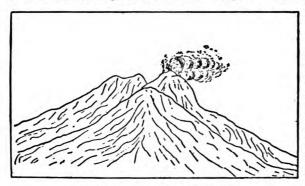
VOLAPÜK (völ-ä-pük'), an artificial language invented for international use in 1878 by Johann Martin Schleyer, a German priest of Constance, Switzerland. He was a diligent student of philology and was acquainted with fifty different languages. The name Volapük means world speech and was compounded from two words in the new language, vol meaning world and pük meaning speech or discourse. It was the aim of the author to construct a language which would be free from irregularities in grammar, orthography, pronunciation, and syntax, thus making the new language regular and easy to learn.

In Volapük the sounds are represented by 37 letters. To the five pure vowels are added the German umlauts, which are placed over a, o, and u, thus ä, ö, and ü. The chief advantage is that the language may be learned in a few weeks. Much progress in the study of Volapük has been made in France, Switzerland, Germany, and in some sections of the United States. The inventor of the language published a grammar and dictionary of it in 1880 and about 2,000 books have been written in that dialect. A number of periodicals are published in it. Many national and international associations have been organized to extend its use. However, more recently it has been displaced to some extent by Esperanto.

See Esperanto. VOLCANO (vŏl-kā'nō), a mountain which has an opening and during a period of activity throws out heated matter from the interior of the earth. The opening, which may be either on the top or the side of the mountain, is called the crater. Volcanoes are of somewhat different shapes, but the crater is always surrounded by a conical deposit of ejected matter, usually in more or less concentric layers. The ejected matter consists of enormous quantities of volcanic ashes and lava, which are forced from the interior of the earth through a pipe or vent. Three classes of volcanoes have been recognized, including the active, the intermittent, and the extinct. The nature of these is explained by the names given to each. At the beginning of an eruption vast quantities of vapor escape through the crater, which, on cooling, condenses and forms dense clouds and afterward falls in torrents of rain. Large quantities of gases accompany the vapors, usually sulphurous acid gases, and later melted rock or lava and ashes are ejected with great violence.

The lava thrown from volcanoes is generally of a dark color and its texture is hard, but sometimes porous and spongy materials sufficiently light to float on water are ejected in large quantities from the vent. The flow of the lava depends upon its heat and the slope of the mountain side. Frequently it has a forward movement of ten miles per hour, but its velocity lessens as an upper crust forms and retards the rapidity of the flow. Many volcanic islands were formed entirely by lava streams. It is assumed that Iceland and the Hawaiian Islands were produced by lava emitted from numerous volcanic cones. Ashes or cinders are thrown with great violence from the craters of most volcanoes and, when falling directly back to the mountain, aid in rearing the cone. Heavy showers of ashes are the most destructive of the materials ejected, since they pile up in enormous drifts, as was the case in 79 a. D., when Pompeii and Herculaneum were entirely buried. The ashes are sometimes carried hundreds of miles by the wind, and their fall is frequently accompanied by heavy rains, caused by the ejected vapor of water.

It is not definitely known how many volcanoes exist, but good authorities place the number at 672, of which 270 are active. Of the active volcanoes, 95 are on the coasts of continents and 175 are on islands. Volcanoes form various groups of mountains, or appear as isolated conical elevations. To the latter class belong Vesuvius, Etna, and the peak of Teneriffe. They oc-



VOLCANO BULUSAN, PHILIPPINES.

cur frequently in a continuous line. The most notable volcanic region of America extends from southern Chile to northwestern Alaska, though the active volcanoes are largely in the tropical region, including Popocatepetl, Orizaba, Cotopaxi, Pinchincha, and Jorullo. A line of similar extent passes from the Moluccas, along the eastern part of Asia, through Kamchatka, and by way of the Aleutian Islands into Alaska. This region includes many active cones, especially in the Philippines, of which the volcano Bulusan is a representative. The volcanic region of Europe and Asia is confined largely to the Mediterranean, passing from the Caspian Sea to the Azores, and embracing the Grecian Archipelago and the southern peninsulas of Europe. Isolated volcanic groups occur in divers regions, such as those of Madagascar, the Hawaiian Islands, Iceland, and Mauritius.

Many volcanic regions are submerged by the sea, though it is much more difficult to observe their action than that of those located on the land areas. Large volumes of smoke and great flames issued from the Pacific Ocean near Unalaska, an island of the Aleutian group, in 1796, and subsequently a volcanic crater was raised above the level of the water. Sailors visited the region in 1802 and found the surface highly heated. This particular volcano is now several thousand feet in height and has a circumference of three miles. Several instances of the total

disappearance of islands are on record. They became submerged through volcanic action, as was the case in Java in 1772, when a mountain totally disappeared. Earthquakes usually accompany volcanic action, and both are attributed to the same cause; namely, the contraction of a cooling crust. It is thought that the materials of the interior are crowded into a smaller space as the heated earth cools and the crust contracts, thus causing the highly heated gases or vapors to exert sufficient pressure to form craters, from which the lava and other materials are thrown.

VOLE, the name of a genus of rodents which belong to the same family as the muskrat and the lemming. The name is not used exten-

sively in America, where similar animals are popularly called field mice. Several species of these animals are found in Europe and America. The field vole, known locally as the short-tailed field mouse, is about the same size as the common mouse, but has a stouter body and the tail is somewhat shorter. familiar species is the water mole, known in some sections as the water rat. It is about the size of the brown rat, has strong hind legs and blackish or dark brown fur, and feeds chiefly on vegetable food. It is called water mole from its living in burrows near streams and lakes. A species known as the bank mole has a rusty-colored fur and the tail is quite short.

VOLGA (vŏl'gà), the largest river of Europe, which is situated entirely in Russia. It rises in the Valdai Hills and, after a general course of 2,400 miles toward the southeast, enters the Caspian Sea near Astrakhan by seventy mouths. The Volga basin is estimated at 550,000 square miles and includes the heart of European Russia. Among the chief tributaries are the Oka and Kama. On its banks are the thriving cities of Astrakhan, Saratov, Samara, Kazan, Novgorod, Kostroma, Simbirsk, and Tsaritsyn. The Volga is navigable almost its entire distance and is connected by an extensive system of canals with the Baltic, Black, and Polar seas. The basin is a highly productive region. fisheries include those of the sturgeon and salmon, large quantities of which are exported.

VOLT, the practical unit of electro-motive force, or potential difference, so named from Alessandro Volta, the inventor of the voltaic cell. The pressure is about equal to that produced by the common bluestone cell, usually employed in telegraphy, or a pressure sufficient to cause a flow of one ampere per second against

a resistance of one ohm.

VOLTA (völ'tà), Alessandro, natural philosopher, born in Como, Italy, Feb. 18, 1745; died March 5, 1827. He descended from a noble family and received a liberal education. In 1774 he became professor of natural philosophy at Pavia, where he taught successfully until 1804,

when he resigned to devote his attention to various writings on physics. He visited Germany, France, and Holland in 1782 and was called to Paris by Napoleon in 1801, where he received a medal for his discoveries in electricity and was made a member of the French Institute. In 1815 he became director of the philosophical faculty of Padua under the patronage of the Emperor of Austria, but retired in 1819. Volta is the inventor of the electroscope, the electrophorus, and the voltaic pile. The last named is an arrangement for producing electricity by chemical action on plates of dissimilar metals, as zinc and silver, zinc and copper, or zinc and platinum.

VOLTAIC PILE (vŏl-tā'īk). See Galvanic Battery.

VOLTAIRE (vŏl-târ'), François Marie Arouet, eminent author, born in Paris, France, Nov. 21, 1694; died there May 30, 1778. He



FRANÇOIS VOLTAIRE.

was the son of François Arouet, an official of France, and was named Voltaire from the estate of his mother. His early education was intrusted to the Jesuits. Afterward he pursued a course in law, but soon abandoned the legal profession for a course in literature.

1718 he published a tragedy entitled "Oedipe," which was his first highly successful production. Now popular as a writer and speaker, largely because of his wit and brilliancy, he became a favorite in the state society of Paris. At about that time he became known as Voltaire, but his career was temporarily checked by being imprisoned at the Bastile in 1726, owing to having challenged Chevalier Rohan to fight a duel on account of an insult. He was liberated after a few weeks, and at the invitation of Lord Bolingbroke visited England. The visit extended over a period of three years, a sufficient space of time to enable him to become acquainted with English literature and many noted men. George I. had died while Voltaire was in England, and, on the accession of George II., his queen, Caroline, extended marked favors to the writer.

His poem, "Henriade," had been published before returning to France and brought him a fortune, thus enabling him to live quite independent at Paris until 1734, when he took up his residence in Lorraine. There he received distinguished favors from the Marchioness de Châtelet, with whom he resided until her death in 1749, when he accepted an invitation of Fred-

erick the Great to reside at his court in Potsdam, Germany. He remained at the Prussian court for three years, where his reception and early career was one of exceptional brilliancy, but later he became implicated in a series of disagreements and court quarrels. Soon after he retired from the court and took up his residence at Strassburg and Colmar. Subsequently he purchased the estate of Ferney, four miles from Geneva, where he resided about twenty years with his niece, Madame Denis. His life at Ferney was one of notable activity in literature. It was there that many of his fine tragedies and historical works were produced, and his home became noted as a place where the most celebrated men of Europe visited. He maintained an extensive correspondence, which included literary intercourse with many of the noted scholars and princes of Europe, and wrote a number of criticisms, poems, and philosophical treatises.

Louis XIV. having died, he was permitted to return to France, and on Feb. 10, 1778, was received at Paris after an exile of 28 years. His reception was attended by great enthusiasm, not directly from the court, but the distinction shown came from the Academy and all classes of society. Voltaire lived the life of an atheist, opposed fanaticism and superstition, and denounced both priestcraft and Christianity. He completed his famous play, "Irene," after returning to Paris and witnessed its production on the stage, but died before the end of the year. He was buried at the abbey of Scellieres in Champagne, but the remains were removed to the Pantheon in 1791. The complete works of Voltaire have been published in ninety volumes and may be said to cover almost every branch of literature. His most noted historical works include "Louis XIV.," "Charles XII.," and "Peter the Great." Among his tragedies are "Merope," "Zaire," and "Mahomet." His essays include "The Manners and Spirit of Nations" and his philosophical novels, "Candide" and "Zadig."

VOLTMETER (volt'me-ter), an instrument for measuring electro-motive force. Several instruments of this kind are in general use, but the most common form is a galvanometer arranged so volts may be read directly by means of a pointer and a scale. It has a movable coil mounted on jeweled bearings, and the coil is kept in position by fine spiral springs. In some types the movement of the pointer depends upon the movement of a piece of soft iron on a coil, while in others it is influenced by the movement of one coil with respect to the other. The difference of potential is measured in some voltmeters by the effect of heat upon a long platinum wire, the heat being due to the passage of a current. See Galvanometer.

VOLUNTEER (vol-un-ter'), a citizen who enters the military service of his own accord, or who in the time of war offers his service to the country. The name volunteers is applied in

most armies to those men or officers who offer to take part in an assault of peculiar danger, as in an attempt to capture a powerful battery or to storm a fortress. Such enterprise is often called the forlorn hope and the survivors usually receive promotion or are specially awarded. The attempts to wrest Jerusalem from the Mohammedans, known as the Crusades, included the largest number and one of the most famous instances of volunteer service for a laudable purpose. In 1794 and in 1803, when 400,000 men were under arms, the British volunteered to repel a threatened invasion of the French. Another notable example may be cited in the large number of volunteers who joined the German armies to accomplish the overthrow of Napolean in 1813-1814 and resumed their occupation after that purpose was consummated. During the Civil War in the United States, from 1861 to 1865, there were 2,656,533 men in the Federal service and the greater number of these were volunteers. Practically all the men added to the service in the United States at the time of the Spanish-American War were

VOLUNTEERS OF AMERICA, a religious movement started in 1896 by Ballington Booth, son of William Booth. The promoter of this organization was previous to that time commander in America of the Salvation Army and he and his wife, Maud Ballington Booth, withdrew from the regular organization on account of not approving certain orders promulgated by General Booth. It is organized similar to the general form of organization in the army of the United States and the purpose is to promote religious, charitable, and educational work. In 1908 it had 680 corps, or societies, in the United States, to which country it is chiefly confined. Both indoor and outdoor meetings are held, prisons are visited, destitute are aided by lodging and the obtainment of work, and Christian literature is distributed. A special feature is to enlist the attention of convicts who are released from prison. Persons of this class usually are lodged until work is found for them.

VOMITING (vom'it-ing), the act of ejecting some of the contents of the stomach, through its own spasmodic contraction, by way of the mouth. It is usually preceded by a feeling of nausea, a free flow of saliva in the mouth, and frequently by a headache and free perspiration. The immediate cause is a contraction of the abdominal muscles, assisted by the active cooperation of the muscular walls of the stomach, while the diaphragm affords a firm surface against which the stomach is pressed by the abdominal muscles. An overloaded stomach, entrance of poisonous substances into that organ and some diseases and conditions of the body are among the chief causes of vomiting. It frequently accompanies seasickness. Those suffering with this ailment should lie down to rest. Mild stimulants, a small quantity of soda, or an external application of mustard at the pit of the stomach often furnish relief. Some animals, as the lama and the vultures, eject the contents of the stomach as a means of defense against their enemies.

VONNOH, Robert William, portrait painter, born in Hartford, Conn., Sept. 17, 1858. He attended the Boston public schools and the Normal Art School in that city, and subsequently studied under Boulanger and Lefebvre, in Paris. In 1891 he returned to America and devoted much of his time to portrait painting, but also produced a number of valuable figure and landscape paintings. Shortly after his return to America he became instructor in painting at the Pennsylvania Academy of Fine Arts, remaining there until 1896. A number of his productions were on exhibition at the leading expositions of America, including those at Chicago and Saint Louis. His works include "A Poppy Field," "Little Louise," "Sad News," and "Miss Mildred Blair." His wife, Bessie Potter Vonnoh, a sculptor, was born in Saint Louis, Mo., Aug. 17, 1872. She studied at the Chicago Art Institute. In 1904 she was awarded the gold medal at the Louisiana Purchase Exposition, Saint Louis.

VOORHEES (vor'hez), Daniel Woolsey, statesman, born in Butler County, Ohio, Sept. 26, 1827; died April 10, 1897. In 1849 he grad-

uated from Asbury University, Indiana, and, after studying law, began a successful practice in 1851. He became United States district attorney for Indiana in 1858, serving in that position for three years. In 1860 he was elected to the United States Congress as a Democrat DANIEL W. VOORHEES. and was reëlected three



times consecutively. He was chosen United States Senator in 1877 and served in that position until his death. Voorhees was an able speaker and writer. He served for many years as a member of the finance committee and was an influential advocate of bimetallism.

VORONEJ (và-rô'nyěsh), or Voronezh, a city of Russia, capital of a government of the same name, about 360 miles south of Moscow. It is situated on the Voronej River, a tributary of the Don, and has railroad connections with the Sea of Azov. The noteworthy buildings include the military school, the post office, two cathedrals, a public gymnasium, and the central railroad station. It has systems of public lighting and waterworks. Among the manufactures are woolen and linen goods, clothing, earthenware, leather, soap, and machinery. It has a large trade in farm produce and sugar. Its extensive distilleries and tobacco factories are among the largest in Europe. The city was founded in 1586. It was strongly fortified by Peter the Great. Population, 1917, 91,414.

VORTICELLA (vôr-tǐ-sĕl'là), a genus of infusorians found both in fresh and salt water. They are very numerous and many forms are The head is bell-shaped and is microscopic. fixed upon a stem, which is capable of being extended and contracted greatly. Around the mouth, or oral disk, are many long cilia and these are constantly in motion to draw in food. This motion causes a movement of the water at the mouth and is spoken of as the miniature whirlpool of the vorticella. Formerly the name was extended to a large group that live in colonies, but these have been separated from the true vorticellas and are now regarded as other genera.

VOSGES (vōzh), a mountain range of Europe. It is situated north of the Jura Mountains and forms a part of the boundary between Germany and France. The range is twenty to fifty miles wide, has valuable forests, and affords fine pasturage. Most of the peaks are rounded and are generally called ballons. Ballon de Guebwiller, height 4,688 feet, is the highest peak. The region has valuable deposits of copper, lead, salt rock, silver, and coal. The Moselle, Saar, Saone, Ill, Meurthe, and Lauter rivers rise in the Vosges. A department of France, lying west of the Vosges Mountains, is called Vosges and has an area of 2,270 square miles

VOSS (fos), Johann Heinrich, educator and author, born in Sommersdorf, Germany, Feb. 20, 1751; died in Heidelberg, March 26, 1826. After studying in several institutions of higher learning, he became a private tutor, and in 1772 went to Göttingen to engage in editorial work. Later he became rector of the gymnasium in Otterndorf, in Hanover, where he published his celebrated version of the "Odyssey," which has remained the standard translation of that Homeric poem in the German. In 1789 he issued his translation of Virgil's "Georgics," four years later published a version of the "Iliad," and in 1799 completed his edition of the "Aeneid." These works were so ably written that Niebuhr declared that future commentators would be unable to improve them. He discontinued teaching in 1802 and retired to Jena on a pension. Later he removed to Heidelberg, where he was granted a pension of 1,000 florins by the Duke of Baden, and spent the remainder of his life in literary work. His chief writings include "Critical Treatise on Literature," "Letters on Mythology," and the narrative poem "Luise." He made many translations from Horace, Hesiod, Aristophanes, and Theocritus, In 1803 he published a review of Heyne's edition of Homer in the Jena General Literary Magazine.

VOSS, Richard, dramatic poet, born in

Neugrab, Germany, Sept. 2, 1851. His early life was spent in the agricultural districts and at the outbreak of the Franco-Prussian War, in 1870, he entered the military service as an ambulance nurse. After the close of the war he studied philosophy at Jena and Munich and devoted himself to literature. In 1878 he married and went to Italy, residing alternately near Rome and on his estates in Germany. As a dramatic poet he takes high rank, both in the quality and number of his productions. Among his best known works are "Mother Gertrude," "Regula Brandt," "Tragedy of an Actress," "Modern Romans," "Roman Village Stories," "Michael Cebula," "Savonarola," "Roman Fever," and "Infallibility."

VOTE, a formal expression of the will in regard to some question submitted for decision, as in enacting laws, passing resolutions, or electing officers. Every organized assembly has special rules governing the mode of voting. Most questions of importance are submitted by assemblages to a roll-call vote, in which each member responds to his name and states the side of the question that he favors by his vote. Other modes include the viva voce, in which the members utter the aye or no in response to the question; the rising vote, where the members indicate by standing whether they favor the affirmative or negative side; and the division, in which the members voting form different sides to be counted by tellers. Voting at public elections is by a ticket or ballot, on which the candidates' names are printed, and each voter indicates by an arbitrary mark the particular candidates favored, as in the Australian ballot system.

VOTING MACHINE, a mechanism used for automatically recording and counting votes. Devices of this kind have been suggested to prevent repeating and other frauds in elections. The first experiment with a machine of this kind was made in 1892, when certain town officers were elected in New York. The following year several states passed laws permitting the use of voting machines, some at local elections and others at all elections, the adoption to be optional with local boards. It was found that the machines were not only effective in overcoming fraud, but permitted voting with facility and the result was known immediately upon the close of the polls.

Many forms of voting machines have been devised and patented. In the common style of machine it is customary to have a ballot on the plan of the Australian ballot, and the voter who enters the booth may so manipulate a keyboard that the candidates for which he wishes to vote are indicated by a cross, or X, which appears to the left of the printed name. In addition there are keys for voting yes and no on amendments or special propositions submitted. Another form is to press a button, after turning an indicator to point to a particular candidate,

VEL

3065

when the machine will register the vote, and the mechanism is so constructed that it is locked until turned to the next list of names under a particular office, the arrangement being in alphabetical order.

A device known as the Standard Voting Machine was used in many cities of New York in the general election of 1900 and since that time. It is about four feet square and ten inches deep and stands about six feet above the floor, being supported by legs. A bar projects from the upper corners so as to form the support for a curtain that constitutes a booth. The lever is thrown by the voter in such a manner that the curtain closes behind him so as to isolate him from others in the same room. He may elect to vote a straight ticket, in which case he pulls a knob over the party named and directs all the pointers to indicate that ticket. On the other hand, he may vote a mixed ticket by moving the pointer back from over the name that does not suit him and, instead, indicate his preference bymoving the pointer to the opposing candidate. Having fully adjusted the pointers to indicate the exact candidates for which he wishes to vote, he operates the lever, thus casting his vote in secrecy and opening the curtain, which has the effect of locking the mechanism and placing it in condition for the next voter.

VOWEL (vou'ěl), or **Vocal**, an articulated sound which is made with the vocal organs open, hence consists of pure tone only. The vowels in the English alphabet are represented by the five letters a, e, i, o, u, and sometimes w and y. They differ from consonants in that the latter sounds are made by the vocal organs being obstructed in the process of articulation, or are mere emissions of breath articulated by the lips, tongue, teeth, and palate. See **Consonants**.

VULCAN (vul'can), in Roman legends, the god of fire and of metals. He was the son of Jupiter and Juno, but, being deformed at birth, his mother dropped him into the sea, where he associated with the sea gods for nine years. After returning to Olympus, he became involved in a quarrel between Jupiter and Juno and was banished from the seat of the chief gods to the island of Lemnos. There he became celebrated as a worker of metals by means of fire, and is reputed the maker of a scepter for Jupiter, weapons for Hercules, and the armor borne by Achilles. He failed in winning the favor of Minerva, and became united in marriage to Venus. The worship of Vulcan never became widespread among the Romans, though they retained a temple to his honor at Rome. He ranked among the twelve great gods of Olympus, whose gilded statues were arranged consecutively along the walls of the Forum. He corresponds to the Greek Hephaestus.

VULGATE (vŭl'gāt), the most celebrated translation of the Bible into the Latin language, which, in its revised version, is the accepted standard of the Roman Catholic Church. Saint

Jerome had been engaged to correct the *Itala*, an older Latin translation, and while at work formed the plan of making an entirely new version of the Scriptures. He commenced his labor about 383 A. D. and completed the entire work in 405. In the 9th century this translation entirely superseded the Latin version of the 2d century. The Council of Trent, while in its fourth session, on May 27, 1546, declared the Vulgate to be a standard in all sermons, expositions, and public lectures. Pope Clement VIII. made a revision of the Vulgate in 1592-1593, and this work is the basis of the modern Douay version, completed in Douay, France, in 1609.

VULPIUS (fool'pē-oos), Christian August, noted author, born in Weimar, Germany, Jan. 23, 1762; died there June 26, 1827. After receiving instruction from private tutors, he studied at the universities of Jena and Erlangen, where he made a specialty of Latin and modern literature. In 1791 he published "The History of Ancient Romance." He was appointed secretary of the court theater at Weimar in 1797, which was at that time under the direction of Goethe. While there he published many operas, dramas, and historical works based on ancient literature. Among his chief works are "Rialdo Rinaldini," a romance, "Ancient Anecdotes," and "Curiosities of Antiquity." His sister, Christina Vulpius (1765-1816), became the wife of Goethe in 1806. He made her the heroine of his "Venetian and Roman Elegies."

VULTURE (vul'tur), any one of a class of birds of prey, being distinguished by a bare head and for the habit of feeding on carrion.



COMMON VULTURE.

These birds are confined largely to the warmer climates, where they are useful as scavengers to consume the carcasses of animals. In all species the neck is strong, the head is quite level on the top, and the flight is elevated. The large size of the feet and strong legs enable them to walk with comparative ease. The head and neck are destitute of feathers, the beak is elongated, and the upper mandible is considerably curved at the end. They differ from most birds of prey in that the female is smaller than the male and

from the eagles in that they do not carry the food to the young, but swallow the carrion and feed the nestlings from their crop. Vultures have an extraordinary development of the senses of sight and smell, thus enabling them to locate carrion with comparative ease at a long distance.

The turkey buzzard, a species of vulture widely distributed in the warmer parts of America, is a gregarious bird and collects in flocks, both while flying and in the consumption of food. The body is over two feet long, the color is brownish-black, and the extended wings measure

about six feet from tip to tip. An allied species known as the carrion crow is abundant in Central and South America. The California vulture, found only west of the Rocky Mountains, is the largest bird of prey in North America. Its general color is shining black above, with bands of white on the wings, which measure about ten feet when extended. The head and bare neck are orange-yellow and red. Species native to Eurasia and Africa include the griffon, Egyptian, and the cinereous vultures. The lammergeier of Europe and the great condor of South America are noted species.



W WADAI

W, the 23d letter of the English alphabet. It is formed of two V's and has the value of double u. Its use dates from the time when u and v had not been formed into two separate elementary sounds, one into a vowel and the other into a consonant. The name is double u and its oldest form was uu, as in uulfheard. When used at the end of a word or syllable, it is either silent, as in row and low, or has the power of a vowel and modifies the preceding vowel, as in now and curlew. It is silent when initial and followed by r, as in wrong and write. In chemistry, it is the symbol for tungsten, from the German Wolframium.

WABASH (wa'bash), a city in Indiana, county seat of Wabash County, on the Wabash River, 42 miles southwest of Fort Wayne. It is on the Wabash and the Cleveland, Cincinnati, Chicago and Saint Louis railroads. The noteworthy buildings include the county courthouse, the public library, the high school, the Masonic Temple, the Memorial Hall, and the Woman's Orphan Home. Among the manufactures are flour, clothing, furniture, earthenware, farming implements, cigars, and machinery. The surrounding country is agricultural and has deposits of natural gas. Gas and electric lighting, waterworks, pavements, and sanitary sewerage are among the improvements. The place was settled in 1837 and chartered as a city in 1866. Population, 1900, 8,618; in 1910, 8,687.

WABASH, a river of the United States, which rises in western Ohio and after a general course toward the southwest joins the Ohio. In the lower course it forms the boundary between Indiana and Illinois. It is navigable about 300 miles. Among the chief tributaries are the Tippecanoe, Embarras, Little Wabash, and White rivers. The total length is 550 miles. It is connected with Lake Erie by the Wabash and Erie Canal. The cities on its banks include Covington, Peru, Lafayette, Wabash, Logansport, Vincennes, and Terre Haute.

WACHT AM RHEIN (vägt äm rīn), Die, a famous German patriotic song, known among English speaking people as The Watch on the Rhine. The words were written by Max Schneckenburger and the music was composed by Karl Wilhelm. In 1840, when a French army

threatened the left bank of the Rhine, the song was written and immediately became popular. Wilhelm's music, which is for men's voices, was first sung in 1854.

WACO (wā'kō), a city of Texas, county seat of McLennan County, 95 miles northeast of Austin, on the Waco and Northern, the Missouri, Kansas and Texas, the Texas Central, and other railroads. It is finely situated at the junction of the Brazos and Bosque rivers. The surrounding country is noted for its extensive production of grain, live stock, cotton, and fruits. Among the principal buildings are the Federal post office, the county courthouse, the public library, the Baylor University, Paul Quinn College, the Add-Ran Christian College, the Douglas-Shuler School, the Waco Natatorium, and the Academy of the Sacred Heart. The streets are substantially paved and improved by gas and electric lighting, waterworks, sewerage, and electric railways. It has manufactures of cotton-seed oil, flour, cotton and woolen goods, clothing, mattresses, canned fruits and vegetables, carriages, farming implements, machinery, and ironware. It is the center of a growing trade in merchandise and farm produce. The place was settled in 1849 and incorporated in 1850. Population, 1900, 20.686: in 1910, 26,425,

WADAI (wä-dī'), a powerful native state of North Central Africa, situated in the Sudan. It is bounded on the north by the Sahara, east by Darfur, south by French Congo, and west by Bagirmi and Lake Tchad. The area is given as 170,000 square miles. Much of the surface is a broken and thickly forested region with a general elevation of 2,000 feet, but the Guere Mountains in the southwest have a height of 3,000 feet. Rainfall is sparse and the water courses dry up during the summer. The soil is fertile, but the northern section is too dry for general farming, though fine grasses are abundant. Cattle, camels, and horses are grown in large numbers. Rice and wheat are the leading cereals. Other products include ostrich feathers, ivory, timber, maize, and fruits.

The inhabitants consist chiefly of Negroes and Arabs. Mohammedan is the religion of the greater number. The slave trade is still per-

3068

mitted, though it has become greatly restricted under European influence. Wadai was founded as a kingdom in 1625, but paid tribute to Bornu and Darfur for many years. Sultan Ali conquered it about 1860, when European explorers began to visit the section. In 1899 the region was placed in the French sphere of influence. Abeshr is the capital and is on several extensive caravan routes. Population, 2,001,500.

WADE, Benjamin Franklin, statesman, born in Springfield, Mass., Oct 27, 1800; died in Jefferson, Ohio, March 2, 1878. He removed with his father to Ashtabula County, Ohio, in 1821, and spent some time as a wood chopper and cattle drover. Subsequently he studied law and, after being admitted to the bar, in 1827, began a successful practice at Jefferson, county seat of Ashtabula County. He was elected county attorney in 1835 and in 1837 became a member of the State senate, serving with one intermission until 1843. In 1847 he became a district judge in Ohio, and in 1851 was elected to the United States Senate, where he served continuously until 1869. Wade was an able opponent of slavery. He served as chairman of the committee on the conduct of the war, and opposed every proposed compromise between the North and the South that did not provide for the abolition of slavery. Subsequent to the war he took a leading part against the reconstruction policy of Andrew Johnson. After the death of President Lincoln, he was chosen president pro tem. of the Senate. In 1871 he served under appointment by President Grant on the San Domingo Commission. Wade was an able orator and debater. He ranks as one of the most influential statesmen of his time and was familiarly called "Old Ben."

WADE, Decius S., jurist, nephew of the former, born in Andover, Ohio, Jan. 23, 1835. He studied at Kingsville Academy and afterward took a course in law. After being admitted to the bar, in 1857, he entered upon a successful law practice, but responded to the call for 75,-000 volunteers in 1861. He was chosen first lieutenant of his company and afterward defended Cincinnati against the menaces of Kirby Smith. He served seven years as probate judge of Ashtabula County and in 1869 became State senator. In 1871 he was appointed chief justice of Montana Territory, being the first to hold that position, and served until 1887. Subsequently he was a commissioner to aid in revising the code of that State. He is the author of "Clare Lincoln."

WADSWORTH (wodz'wurth), James Samuel, soldier, born in Geneseo, N. Y., Oct. 30, 1807; died May 8, 1864. He studied at Yale and Harvard, and afterward took a course in law in the office of Daniel Webster. After being admitted to the bar, in 1833, he supervised extensive landed interests in western New York, which he had inherited from his father, and gave much attention to the promotion of edu-

cational interests. He served as a member of the peace commission in Washington, D. C., in 1861. At the beginning of the Civil War he enlisted in the Union service and attained to the rank of brigadier general. His services were particularly distinguished at Fredericksburg, Gettysburg, and Chancellorsville. When Grant became commander of the army of the Potomac, Wadsworth was assigned a division of that army. He was fatally wounded in the Battle of the Wilderness on May 6, 1864, and died two days after.

WAGER (wā'jēr), a contract based upon the determination or ascertainment of an uncertain event, under which one of the parties is to make a payment or transfer a valuable consideration to the other. Usually the consideration is placed as a trust in the hands of a third party, who is to deliver it to the one entitled to receive it after the points of uncertainty have been determined. Formerly a wager was valid under the common law, unless it was of a condition that rendered it immoral or opposed to public policy. Now wagers are looked upon in most countries as debts of honor and their payments depend upon the good faith of the parties to the agreement, since they are held to be without a valuable consideration. In most cases it is unlawful to bet or contract a wager in regard to elections.

WAGES, the payment for services rendered, especially the payment of manual laborers receiving a fixed sum for a specified interval of time, as per day, week, or month. Writers generally classify wages as nominal and real. The former indicates the amount of money received for a certain quantity of labor, while the latter has reference to the quantity of commodities which the money received for the labor will purchase. In the case of a man receiving \$1 a day in 1900 and \$1.50 for the same work in 1910, it does not necessarily follow that the wages in the latter case were fifty per cent. higher than in the former, though it might or might not be true. It certainly would not be true if the purchasing power of money were twice as great in 1900 as in 1910. Other conditions modifying wages include the demand and supply of laborers, the skill of those offering to do work, and the agreeableness of the employment. The last mentioned condition applies where men have a desire to do particular kinds of work, since they are usually willing to work for less in an occupation that offers the associations and activities to which their desires

It is common to estimate wages high or low according to the amount of money received for the time employed, but writers more correctly base the estimate of wages on the results achieved. Thus a \$2 ax may be cheaper than a \$1 ax, especially if the work done with it is three times as great as that accomplished by the cheaper one. In the same way, the laborer re-

3069 WAGON

ceiving the highest pay may, by reason of his superior skill, be the cheaper one for the employer. It is certainly in line with good economy to obtain that class of labor which produces the most at the least expense, rather than to secure the kind that can be had at the lowest price. All efforts to fix wages by law have thus far proven inoperative and harmful. Such an effort was made in England in the reign of Edward III. on the part of capitalists, who resorted to that step by reason of a scarcity of laborers, owing to which fact wages were high. The result was that laborers sought employment elsewhere. On the other hand, if a law were enacted to require wages higher than the natural law of supply and demand would warrant, capital would seek investment elsewhere, thus maturing to the injury of those sought to be benefited. See Interest; Labor; Rent; Political Economy; Socialism.

WAGNER (väg'ner), Adolph, economist, born at Erlangen, Germany, March 25, 1835. He studied jurisprudence at Göttingen and political science at Heidelberg, and in 1858 was made professor of finance and political science at the Commercial Academy at Vienna. Subsequently he held a similar position at the University of Dorpat, was made professor of political science at the University of Freiburg in 1868, and two years later was called to the chair of political science at the University of Berlin. From 1882 to 1885 he was a member of the lower house of Prussia, in which office he took a stand favorable to state ownership of public utilities. His publications, both magazine articles and books, are numerous, especially those devoted to the discussion of social science and the practical problems of economics, which he treated from the standpoint of statistics and jurisprudence. Among his leading works are "Contributions to the Theory of Banking," "Hand-book of Political Economy," and "The Science of Finance."

WAGNER, William Richard, musical composer, born in Leipsic, Germany, May 22, 1813; died in Venice, Italy, Feb. 13, 1883. He entered



WILLIAM RICHARD WAGNER.

the Kreuzschule of Dresden in 1822 and in 1828 took up the study of music at Leipsic. His first musical composition was performed in 1833, though he had previously written music under the stimulat-

ing influence of Beethoven. In 1834 he was appointed conductor of the opera at Magde-

burg, a position rather honorary than profitable. He married Wilhelmina Planer, an actress at Königsberg, in 1836, and soon after became musical conductor at Riga, Russia. In 1839 he made his first visit to Paris, where he made an unsuccessful attempt to introduce his opera entitled "Rienzi." He became conductor of the Royal Opera of Dresden in 1843, and from that time his career was highly successful. He was exiled from Germany in 1848 on account of his enthusiasm for the revolution, and established his residence for ten years in Zurich, where most of his celebrated musical productions were written.

In 1859 Wagner made a visit to Paris and introduced his "Tannhäuser" at the Grand Opera, receiving financial support from the Prince and Princess Metternich, but jealousies caused the venture to become unpopular. He was pardoned for his political offenses in 1861 and soon after settled in Vienna. "The Flying Dutchman" (Der fliegende Holländer), a production based on life in the Netherlands, was successfully presented at Munich in 1864, and a few years later the "Master Singers of Nürnburg" was given with eminent success at the same place. Wagner was now liberally supported by Louis II. of Bavaria, who built a theater especially for the celebrated composer at Baireuth. His last noted production, "Parsifal," based on the legend of the "Holy Grail," was completed at Palermo in 1882. Many of the works of Wagner are popular because they are based on Old German heroic legends and are so written that they blend music, poetry, and dramatic representations into one wellbalanced whole. His ability and versatility place him among the most celebrated of modern composers. Among the productions not named above are "Tristan," "Lohengrin," "Siegfried," "The Walküre," "The Isolde," "A Faust Overture," and "The Ring of the Nibelung." He is the author of several books, including "Oper and Rama," "Life of Beethoven," "Knowledge and the Revolution," "A German Musician in Paris," "The Knowledge of the Future," and "Autobiographical Sketches."

WAGON (wag'un), a vehicle with four wheels, especially such a conveyance used for carrying freight or merchandise. A farm wagon is a representative kind of these vehicles. It has four wheels banded with heavy iron tires, has a long rectangular box to contain the load, and is fitted with a wooden tongue so as to be drawn by two horses. Wagons intended for heavy freighting have heavier wheels and a broader tire than those used commonly on a farm. A dray belongs to the wagon type, but differs from it in that it has heavy springs and usually does not carry a box. Road wagons are heavy carriages with springs and seats for four persons. Most wagons are fitted with a movable seat mounted upon springs, have an adjustable set of side boards for hauling grain, and are provided with a movable end gate, or a shovel board.

WAGRAM (vä'gråm), a village in Austria, on the Russbach River, 20 miles northeast of Vienna. It is important as the scene of a noted battle fought in 1809, between the French under Napoleon and the Austrians under Archduke Charles. Napoleon crossed the Danube on July 5 with 150,000 infantry and 30,000 cavalry and surprised the Austrians, but was repulsed. The next day a second attack followed and the Austrians were defeated, the latter losing 25,000 men. An armistice followed on July 11, and the Peace of Vienna, Oct. 14, 1809, terminated the war.

WAGTAIL (wag'tal), the name of a small bird found in Europe, so called from the habit of jerking its tail incessantly. The several species of wagtails run swiftly, have rounded tails, and feed chiefly upon insects and worms. They nest in stony places or among dense herbage. While on the wing, they emit chirping notes and fly by short, undulating courses. The name is given to several species of warblers found in Canada and the United States.

WAHABIS (wä-hä'bêz), a sect of Mohammedans founded about 1750 by Abd-el Waháb, an Arabian reformer. The main tenets of this sect are orthodox and agree with the doctrine of Mohammed, but the purpose is to restore Islam to the simplicity and austerity of its founder. In practice and modes of life these people have been spoken of as the Puritans of Islam. They number about 3,850,000.

WAHPETON (wa'pê-tun), a city of North Dakota, county seat of Richland County, 45 miles south of Fargo. It is situated on the Red River of the North, opposite Breckenridge, Minn., and on the Great Northern, the Northern Pacific, and the Chicago, Milwaukee and Saint Paul railways. The surrounding country is a rich farming district. It has a large trade in grain and merchandise and has manufactures of flour, machinery, and farming utensils. The chief buildings include those of the county, a college, and a number of parochial schools and churches. It has sewerage, waterworks, and electric lighting. Population, 1910, 2,467.

WAITE (wāt), Morrison Remich, jurist and statesman, born at Lyme, Conn., Nov. 29, 1816; died in Washington, D. C., March 23, 1888. His father, Henry M. Waite (1787-1869), was an eminent jurist and provided for the education of his son at Yale, where he graduated in 1837. He was admitted to the bar in 1839 and soon after began the law practice at Maumee City, Ohio. In 1849 he was elected a State legislator and removed to Toledo the following year. He was appointed United States counsel in the Alabama case at Geneva in 1871, served in the constitutional convention of Ohio in 1873, and became chief justice of the United States Supreme Court in 1874. Yale University conferred a degree upon him in 1872, Kenyon

College in 1874, and the University of Ohio in 1879. Many important decisions were made by the court while he served on the supreme bench, which included a period of fourteen years.

WAKE, a term frequently used in place of vigil. It is the name of a festival or anniversary celebration that was formerly universal in England. As a festival it was held on the birthday of the saint of a parish church, which was preceded by a night vigil, but the custom finally degenerated into fairs and exhibits. Edward I. forbade holding wakes in country churchyards and Henry VI. prohibited the sale of all articles at the festivals, except those used as food and refreshments. It is still customary in nearly all countries to hold a wake or vigil by the friends and neighbors of a deceased person prior to burial. The custom is thought to have originated from a superstitious notion in respect to the danger of a dead body being carried off by some of the agents of the invisible world.

WAKEFIELD (wāk'fēld), a town of Massachusetts, in Middlesex County, ten miles north of Boston, on the Boston and Maine Railroad. Among the notable features are the Beebe Town Library, the townhall, and the Wakefield Home for Aged Women. It has manufactures of furniture, boots and shoes, stoves, musical instruments, and ironware. Extensive electric street railway facilities, a good water supply, and electric lights are among the improvements. It was settled about 1640, was incorporated as South Reading in 1812, and was chartered under its present name in 1868. Population, 1905, 10,266; in 1910, 11,404.

WAKE-ROBIN, the name of several species of trillium, which is a genus of low, smooth herbs of the lily family. The rootstock is short, the stem is stout, and at the summit of the latter is a whorl of three large net-veined leaves. The solitary flower has three green sepals and three colored petals and is succeeded by a red or purple berry. Several species are widely distributed from Canada to the Gulf of Mexico. Jack-in-the-pulpit is a common name applied to several species of this plant, while others are known as Indian shamrock and three-leaved nightshade. This genus

of plants includes the calla lily.

WALCHEREN (väl'ker-en), an island of the Netherlands, in the province of Zeeland, near the mouth of the Scheldt. It is 12 miles long and has an area of 81 square miles. The surface is low and is protected from overflow by immense dykes and natural downs, but the surface is highly fertile and productive. Agriculture and stock raising are the chief industries. In 1809 it was occupied by a British fleet as a base from which to attack Antwerp, but the expedition proved a failure and a loss of 7,000 men was sustained. Middelburg is the chief town. The island has a population of 42,875.

WALDECK-ROUSSEAU (val-děk'roo-so'), Pierre Marie Ernest, statesman, born at Nantes, France, Dec. 2, 1846; died Aug. 10, 1904. After completing his general education, he studied law and in 1879 was elected deputy from Rennes. In 1881 he was chosen minister of the interior under Gambetta and held the same position in the cabinet of Jules Ferry from 1883 until 1885. He was chosen a senator from the department of the Loire in 1894 as a moderate republican, and, after the fall of the cabinet of Dupuy, in 1889, he formed a new ministry, whose members, though differing widely on economic questions, were firmly united upon the position of sustaining the republic against the clericals and royalists. In 1900 he sanctioned reopening the Dreyfus case and gave support to a general amnesty law for all who had been connected with it. He resigned in 1902, after taking a prominent part in gaining success for republican principles in the general election that year. His published works include "Question sociales," "Discours parlementaires," and "La defense républicaine."

WALDENSES (wol-den'sez), a Christian sect founded in Italy by Peter Waldo, an influential merchant of Lyons. He became the leader of a considerable number who looked upon the church and the clergy as corrupt and went forth to preach with the view of bringing about a reformation, though not intending to secede from the established organization. About 1170 he sold his possessions and devoted the proceeds to the Christian cause. The Archbishop of Lyons published a command charging that his followers refrain from further activity, but they appealed to Pope Alexander III., who prohibited their meetings. The reform movement continued and gained strength steadily until in the 16th century, when widespread persecutions followed. Large numbers emigrated to Switzerland and Germany in 1681, where they were given entire freedom of conscience. In 1848 religious liberty was granted to them, and soon after they were given equal political rights with the Roman Catholics in Italy. Their chief seat at present is southwest of Turin, but there are about 20,000 in Germany and Switzer-The Waldenses hold the Bible as the only rule of faith, but adhere to their confession of belief published in 1855, which they regard the most accurate of biblical interpretations. The latest official returns indicate that the Waldensian Church in Italy has fifty houses of worship, forty mission stations, and sixty pastors. They publish a considerable number of periodicals, tracts, and other litera-

WALDERSEE (väl'der-zå), Alfred, Count von, military leader, born in Potsdam, Germany, April 8, 1832; died March 5, 1904. He received a general and military education and in 1850 entered the army. In the Austro-Prussian War of 1866, he rendered distinguished services and also in the Franco-German War of 1870-1871. He was aid-de-camp of the king of Prussia in the latter war and rendered gallant services at the surrender of Sedan and in the siege of Paris. At the close of the war he was promoted to the rank of colonel. He was made quartermaster general in 1882, and in 1888 succeeded Count von Moltke as field marshal in the German army. Emperor William II. promoted him to the rank of field marshal in 1895, owing to his success at the annual maneuvers of the German army near Stettin. He was chosen commander in chief of the allied armies

in China in 1900, where he directed the military forces with the approval of the powers. On his return to Germany, in October, 1901, he was decorated by Emperor William II. with the order of Pour le



COUNT VON WALDERSEE.

Merite. Count von Waldersee married, in 1874, Mary Esther Lee, of New York, the widow of Prince Frederick of Schleswig-Holstein.

WALES (wālz), a principality in Great Britain, lying west of England, which has given the title of Prince of Wales to the heir apparent to the British crown since Edward I. The length is 135 miles; breadth, 25 to 90 miles; and area, 7,446 square miles. The coast line is 362 miles long, being formed on the north by the Irish Sea, south by the Bristol Channel and the estuary of the Severn River, and west by Saint George's Channel. Anglesea Island lies immediately north and is separated from Wales by Menai Strait, and on the western shore are Cardigan and Saint Bride's bays. The surface is largely mountainous and rugged. Snowden Mountains, in the northern part, are the highest peaks in the southern part of Great Britain, ranging from 2,350 to 3,570 feet above sea level. Most of the drainage is by the Severn and its chief tributary, the Wye, into Bristol Channel. Other rivers of more or less importance include the Tawe, Conway, Taff, and Dee. Lake Bala is the only inland water.

Wales has valuable deposits of minerals, the most extensive being coal, copper, iron, zinc, lead, silver, gold, limestone, and granite. Coal and iron are worked most profitably, and the coal trade is particularly large. The climate, though somewhat cold and damp, is favorable to agriculture and dairy farming. The chief productions include wheat, rye, barley, potatoes, hay, vegetables, and fruits. Manufacturing is

WALES

3072

an important industry, the products including cotton and woolen goods, ironware, hosiery, cheese and butter, cured fish, machinery, leather, and farming implements. All the domestic animals common to Europe are reared successfully. Railroad lines extend to all parts of the country. It is divided into twelve counties and has a number of thriving cities. Cardiff, the chief seaport and largest city, is the seat of extensive manufacturing and commercial enterprises. The public schools are well established, and the per cent. of illiteracy is small. Several excellent institutions of higher learning are maintained, including Saint David's College, Saint Beuno's

College, and University College.

Wales was invaded by the Romans at the time they occupied Britain, but the inhabitants, being favored by protection in the mountains, long resisted the intruders. These inhabitants were of Celtic origin and were known as Cymri, meaning countrymen or not foreigners. Though the Romans never fully conquered the country, they divided it into districts and called it Cambria. The Anglo-Saxons afterward invaded England, pressing the Britons toward the west, and wars between them and the Celtic tribes were carried on for many years. At that time the Celts came to be called Welsh, an Anglo-Saxon term meaning foreigners, and the country was known as Wales. At first the Welsh were divided into a number of small tribes, but King Roderick the Great united them in the 9th century. Successive advantages were gained by the English,who finally compelled the Welsh to pay tribute to Athelstan and later to Harold. Llewellyn, the last of the Welsh princes, revolted against Edward I., but was slain in a battle against the Earl of Mortimer in 1282. He was succeeded by his brother, David, who assumed the title of Prince of Wales, but was captured in a battle and executed. The country has been incorporated with England since 1284. A final effort for independence was made by the Welsh under Owen Glendower, lasting fifteen years, from 1400 to 1415.

The Welsh are noted for their bravery and generosity. Their language is quite similar to that of the ancient Britons, but it has been greatly improved since the invention of printing. In the alphabet are seven vowels and thirteen simple and seven double consonants, but numerous diphthongs and triphthongs are employed. The Welsh language is spoken exclusively by a large number of the inhabitants, but the larger portion understand and use the English. Many associations have been organized within recent years with the view of cultivating an interest in Welsh literature and promoting the use of the language. This movement, like that recently instituted to maintain the Irish, is meeting with enthusiastic support. The early romances and tales of Welsh literature date from the 8th century, including a collection called the "Mabinogion," and the earliest printed works come from the year 1546. Its literature includes works of importance in history, theology, science, and biography. Population, 1914, 1,722,465.

WALES, Prince of, the title borne by the eldest son of the British sovereign, first conferred on Prince Edward in 1301, who afterward became Edward II. However, the title was not conferred on Edward III., though it has been borne by all the male heirs apparent from the time he conferred it upon his son, Edward the Black Prince. This title is conferred by proclamation or by special creation and investiture. The Prince of Wales, as heir to the crown of Scotland, bears the titles of Prince and High Steward of Scotland, Duke of Rochsay, Earl of Carrick, Baron of Renfrew, and Lord of the Isles. In addition the Prince of Wales, as heir to the crown of Ireland, bears the title of Earl of Dublin. See Prince of Wales.

WALFISCH BAY, or Walfish Bay (wŏl'-fish), a British possession in Africa, situated on the coast of German Southwest Africa, near the Tropic of Capricorn. It has an area of 430 square miles. Besides a small peninsula, it includes a sandy tract on the mainland. The chief productions include fruits and cereals. Horses, cattle, and poultry are raised. It is important for having a good harbor. For the purpose of government it has belonged to Cape Colony since 1878, when it was acquired. Population,

785.

WALHALLA (vál-häl'la), or Valhalla, in Scandinavian legends, the palace in which the souls of those fallen in battle had their habitation, in which they spent their time in joyous feasting. The palace was supposed to be situated in Gladsheim, meaning house of joy, which was surrounded by a grove of golden-leafed trees, and its interior was decorated with the most valuable jewels. It was supposed that the inmates, when aroused by the crowing of the cock in the morning, prepared for a brisk military maneuver, which was carried on relentlessly until noon. At that time all wounds were supposed to be healed and the heroic inmates were permitted to banquet with Odin. They were attended at the feasts by the Walkyries, or battle maidens. Ludwig I. of Bavaria erected a magnificent temple on the Danube, near Ratisbon, in 1832-1842, as a pantheon to the German people. This temple is known as Walhalla, and the idea of its erection was derived from the Walhalla of the ancient Scandinavian deities. It is dedicated to people of all ranks and occupa-

WALKER (wa'ker), Amasa, political economist, born in Woodstock, Conn., May 4, 1799; died Oct. 29, 1875. After attending college, he engaged in commercial pursuits, and in 1842 became a lecturer on political economy in Oberlin College, Ohio. He was elected a member of the Massachusetts assembly in 1848 and of the senate in 1849, where he secured the passage of a bill placing Webster's Dictionary in the common

3073

schools of Massachusetts. He served as Secretary of State from 1851 to 1852 and as a member of Congress from 1862 to 1863. From 1859 to 1869 he delivered lectures on political economy in Amherst College. He was one of the founders of the Free Soil party and became noted as an active worker for temperance. His writings include "Science of Wealth" and "Nature and Uses of Money." He contributed a series of articles to Hunt's Merchants' Magasine.

WALKER, Francis Amasa, statesman and statistician, born in Boston, Mass., July 2, 1840; died Jan. 5, 1897. He was a son of Amasa Walker, graduated from Amherst in 1860, and served in the Union army during the Civil War. His eminent services at Chancellorsville won much praise, and in 1865 he was brevetted brigadier general. From 1865 to 1867 he taught Latin and Greek at Williston Seminary, served as United States Indian commissioner in 1872, and was professor of political economy at Yale University from 1873 to 1881. He became president of the Massachusetts Institute of Technology, Boston, in 1881. He attended an international monetary conference at Paris in 1878. Walker is the author of a number of wellknown writings and was honored by several foreign associations. His publications include "Trade and Industry," "The Wage Question,"
"Bimetallism," "The Indian Question," "Politi-cal Economy," "History of the Second Army Corps," and "Statistical Atlas of the United States."

WALKER, Frederick, painter, born in London, England, May 24, 1840; died June 4, 1876. He studied at the Royal Academy and under private tutors and took up the work of an illustrator and wood engraver. After 1865 he devoted his time chiefly to works in water colors and paintings in oils. He exercised a wide influence upon art in his native country by producing works of much originality and richness in coloring. Among his chief products are "The Wayfarers," "The Harbor of Refuge," "The Right of Way," "The Bathers," "Philip in Church," and "The Vagrants."

WALKER, Robert James, statesman. born

in Northumberland, Pa., July 23, 1801; died in Washington, D. C., Nov. 11, 1869. In 1819 he graduated from the University of Pennsylvania and, after being admitted to the bar, in 1821, removed to Natchez, Miss., to practice the law profession. He was elected to the United States Senate as a Democrat in 1836, which position he held until 1845, when he was appointed by President Polk as Secretary of the Treas-While serving in that position, he prepared the Walker Tariff Bill of 1846, opposed the Bank of the United States, and advocated the gradual abolition of slavery. He was Secretary of the Treasury from 1845 to 1849. President Buchanan appointed him Governor of the Territory of Kansas in 1857. He was made

financial agent of the United States in 1863 and in that capacity visited Europe, where he negotiated \$250,000,000 of the 5-20 U. S. bonds. Subsequently he practiced law in Washington, D. C. He contributed a series of articles to the Continental Monthly.

WALKER, William, adventurer, born at Nashville, Tenn., May 8, 1824; executed Sept. 12, 1860. He studied at the University of Nashville, where he graduated, and subsequently pursued advanced courses at Edinburgh and Heidelberg. In 1850 he returned to the United States and became an editor and journalist in California. Three years later he organized an expedition to conquer the northwestern part of Mexico, where he undertook to found a republic, and after capturing a number of small towns proclaimed himself president. A strong force of Mexicans was sent against him, but he crossed the boundary and at San Diego surrendered to officials of the United States, by whom he was acquitted on the charge of having violated the neutrality laws. In 1855, taking advantage of a civil war in Nicaragua, he invaded that country and captured Grenada. He formed an alliance with General Corral, the president, who made him the chief military officer. They soon quarreled, but Walker, taking advantage of the unrest in the country, captured Corral and had him convicted and shot for conspiracy. Walker proclaimed himself president, but his arbitrary government caused him to be expelled from Grenada. He surrendered to the United States authorities and was conveyed to New Orleans, but soon after invaded Nicaragua a second time. Again driven from the country, he made an unsuccessful attempt to conquer Honduras, where he was court-martialed and shot at Truxillo.

WALKING STICK, the popular name of several insects found in the warm climates and the warmer part of the Temperate zones. They belong to the leaf insect and very closely resemble the stalks of grass and other plants among which they live. The common walking stick is about three inches long. It has a jointed body and four jointed legs. Those found in the tropics are much larger, frequently nine or ten inches in length. Some of these insects have the form of twigs and leaves, but the majority

are cylindrical like a small stick.

WALLACE (wol'las), a city of Idaho, county seat of Shoshone County, on Placer Creek. 110 miles east of Spokane, Wash. It has transportation facilities by the Northern Pacific Railway and the line of the Oregon Railroad and Navigation Company. The surrounding country produces large quantities of gold, silver, and lead. Lumbering is an important industry in the vicinity of Wallace. The chief buildings include the county courthouse, the public high school, and numerous churches. It has manufactures of lumber products, machinery, spirituous liquors, and utensils. The trade is chiefly

3074

in merchandise, minerals, lumber, and live stock. Population, 1900, 2,265; in 1910, 3,000.

WALLACE, Alfred Russell, naturalist and traveler, born at Usk, England, Jan. 8, 1822; died Nov. 7, 1913. He studied at Hertford and, after taking a course in land surveying, made a voyage to Brazil in 1848 in company with a scientific expedition. After traveling four years, he returned to England and published "Travels on the Amazon and Rio Negro." Soon after he sailed to the Malaysian Islands, where he spent eight years in an exploring tour. The various species of plants and animals coming under his observation caused him to inquire as to their origin, and he prepared a paper containing the theory of development by natural selection, thus anticipating the theory of evolution as announced by Darwin. This paper is entitled "Speculation on the Origin of Species" and was read before the London Linnaean Society in 1858, along with the paper of Darwin entitled "Tendency of Species to Form Varieties." Wallace was made president of the Biological Section of the British Science Association, in 1876, and in the same year published "Geographical Distribution of Animals." He was granted a pension of \$1,000 in 1881 and received the Darwin Medal of the Royal Society and a degree from Oxford University. Among his writings not mentioned above are "Tropical Na-"Island Life," "Australia and New Zealand." "Land Nationalization," "Forty-five Years of Registration Statistics," "Forty Years of Bad

Times," and "Miracles and Modern Spiritualism." WALLACE, Lewis, soldier and author, born in Brookville, Ind., April 10, 1827; died Feb. 15, 1905. After attaining to a common school



LEWIS WALLACE.

education, he studied law and began the practice of his profession at Crawfordsville, Ind. At the beginning of the Mexican War, he volunteered and was made first lieutenant. He practiced law from 1848 to 1861 and in the meantime served a term in the Indiana State Legislature. He

was appointed adjutant general of Indiana at the beginning of the Civil War, but soon after became a colonel, and in 1861 defeated the Confederates at Romney, W. Va. Subsequently he took part in the capture of Fort Donelson and the Battle of Shiloh, and aided in defending Cincinnati against Kirby Smith. In 1864 the Confederates defeated him at Monocacy, but he detained the enemy a sufficient length of time to enable Grant to prevent the capture of Washington. Wallace served on the court that tried the assassins of President Lincoln. He was Governor of New Mexico from 1878 to 1881, and minister to Turkey from 1881 to 1885. He is the author of "Ben Hur, a Tale of the Christ," which had a greater sale in America than any romance, except "Uncle Tom's Cabin." Other writings include "The Fair God," a story of the conquest of Mexico, "The Prince of India," "The Boyhood of Christ," and "The Life of Benjamin Harrison."

WALLACE, Sir William, celebrated patriot and soldier of Scotland, born about 1270; executed in London, England, Aug. 23, 1305. It is thought that he was a son of Sir Malcolm Wallace of Ellerslie and that he studied at Dundee, where he probably developed his heroic love for the independence of Scotland by learning the history of the English policy to conquer his country. He is noted for courage, physical strength, and the brave devotion with which he fought against Edward I., King of England, with the view of maintaining the freedom of his native land. He gathered a small band of his countrymen and made several successive attacks on the English, thus causing a number of the Scotch barons to join him. At last the Earl of Surrey, English Governor of Scotland, marched against him with an army of 50,000 men, but Wallace succeeded in defeating the English at Stirling Bridge, on the banks of the Forth, Sept. 10, 1297. He immediately followed up his victory by invading the northern counties of England and, on returning to Scotland, was made guardian of the kingdom. The English gathered an army and invaded Scotland and, being deserted by a number of Scottish nobles, Wallace was defeated at Falkirk on July 22, 1298. He and a number of followers fled to the mountain districts, but a large reward caused him to be betrayed and captured. Wallace was taken to London, where he was given a mock trial and executed as a traitor. His head was exposed on London bridge as a warning to those who opposed King Edward. On the summit of Abbey Craig, near Stirling, is a memorial to Wallace.

WALLACHIA (wŏl-lā'kĭ-à). See Rumania. WALLACK (wŏl'lak), John Lester, actor, born in New York City, Jan. 1, 1820; died Sept. 6, 1888. He became interested in the stage at an early age, but did not make his appearance at the New York Bowery Theater until in 1847, when he made a success as Sir Charles Coldstream in "Used Up." His father, James William Wallack (1794-1864), was a British actor and in 1861 established the Wallack Theater in New York City, of which the son became proprietor in 1864. He conducted that theater for 24 years. He wrote a number of pieces for the stage, including "Rosedale" and "The Veteran." Scribner's Monthly published a series of articles written by him.

WALLA WALLA (wŏl'la wŏl'la), a city in Washington, county seat of Walla Walla County, 242 miles northeast of Portland, Ore. It is situated on the Walla Walla River, has communication by the Northern Pacific and the line of the Oregon Railroad and Navigation Company, and is the shipping point of large quantities of live stock, grain, vegetables, and fruits. The site has an altitude of 1,050 feet and is surrounded by a fertile section of farming land. It is the seat of Whitman College, the State penitentiary, the De La Salle Institute, the Saint Vincent's Academy, the Saint Paul's Episcopal School, and the Walla Walla College. Other features include the county courthouse, the public library, the high school, the Odd Fellows' Home, the Saint Mary's Hospital, and the Stubblefield Home for Widows and Orphans.

Walla Walla has extensive commercial and industrial interests. Among the manufactures are hardware, cigars, clothing, furniture, machinery, earthenware, flour, and cheese. It has gas and electric lighting, sanitary sewerage, public waterworks, and electric street railways. A military post was established here in 1856, when it was called Steptoe City, but it was incorporated under the present name in 1868. Population, 1900, 10,049; in 1910, 19,364.

WALLENSTEIN (wol'en-stin), Albrecht Wenzel Eusebius von, eminent German soldier, born in Hermanitz, Bohemia, Sept. 14, 1583; assassinated at Eger, Feb. 25, 1634. His father and mother were members of the Bohemian Evangelical Church, but both died while he was yet young, and he was sent to the Jesuit College at Olmütz. While there he embraced the Roman Catholic faith. Subsequently he studied at Altdorf, Bologna, and Padua, and afterward visited many parts of France, Germany, and the Netherlands. Later he joined the imperial army for service in Hungary against the Turks, and at the close of the war, in 1606, married a widow of noble rank. She died in 1614, leaving him a vast fortune, and he soon after received the title of count and the military rank of colonel. When the insurrection broke out in Bohemia, he firmly adhered to the imperial side, and at the cessation of hostilities purchased a number of estates which he erected into the state of Friedland. Soon after Ferdinand II., who felt impelled to recompense the valuable service of Wallenstein, made him a prince of the empire and conferred upon him the title of duke of Friedland. He raised an army of 30,000 men in 1626 to aid Emperor Ferdinand and soon after allied his forces with Tilly, the famous German military leader, against Christian IV. of Denmark and General Mansfield. Tifly defeated Christian IV. at Lutter and Wallenstein overcame the forces of Mansfield at the bridge of Dessau, thus compelling Christian IV. to agree to a treaty of peace in 1629.

Though an efficient military leader, Wallenstein had many enemics among the nobles and the people; the former were jealous of his successes and the latter felt outraged by the vast destruction of property by his army. Ferdinand finally dismissed him from the service in 1630 and he retired to Gitschin, capital of his duchy of Friedland. However, when Gustavus Adolphus invaded Germany, he was promptly recalled to the service. An army of 40,000 men was placed at his disposal, with which he expelled the Saxons from Bohemia and laid waste a large portion of that country. Sweeping northward to expel the invading Swedes, he fought the battles of Nuremberg and Lützen, but in the latter he was entirely defeated, though Gustavus Adolphus was among the slain. Wallenstein failed to make use of the temporary advantage following the death of the Swedish leader, largely because he was planning to make himself sovereign of Bohemia. This scheme was soon after discovered and an order was issued from Prague in which he was charged with treason. He took refuge with a small band of adherents at Eger, where he was afterward assassinated by several dragoons. Wallenstein ranks as one of the most famous military leaders employed by the Catholic League and its supporters in the Thirty Years' War, though that organization, under the leadership of the Duke of Bavaria, became his adversary. He was ardent in his opposition to Protestants, but is generally credited with greater liberality and religious tolerance than Ferdinand II.

WALLER (wŏl'ler), Edmund, poet, born at Coleshill, England, March 3, 1606; died Oct. 21, 1687. He descended from an ancient and wealthy family, studied at the University of Cambridge, and obtained a seat in Parliament at the early age of eighteen years. At first he was opposed to the Royalists, but was won over by them and entered what is known as the Waller's Plot to restore royal authority. This plot was discovered and he confessed, but escaped by a heavy fine and banishment, while a number of his companions were hanged. In 1653 he was permitted to return, when he became a close friend of Cromwell. The remainder of his life was spent largely in literary work, but he again entered Parliament in 1661. His poems are noted for correct versification and his works are written with the smoothness of those of Pope and Dryden. The two poems by which he is best known are "On a Girdle" and "Go, Lovely Rose."

WALLINGFORD (wol'ling-ferd), a borough of Connecticut, in New Haven County, twelve miles northeast of New Haven, on the Quinnipiac River and the New York, New Haven and Hartford Railroad. It is the center of a growing trade in merchandise and general manufactures. The streets are well platted and improved, being generally graded and paved,

and it has electric railway connection with the leading cities of the State. Among the manufactures are brassware, furniture, machinery, hardware, tools, rubber goods, clothing, and silver-plated ware. It has electric lighting, sanitary sewerage, waterworks, and several fine schools. The borough was incorporated in 1670 and near it was established, in 1851, the Wallingford Community, a society similar to the Oncida Community. At present the State Masonic Home occupies the community property. Population, 1900, 6,737; in 1910, 8,690.

WALLOONS (wol-loonz'), a class of people occupying the southeastern part of Belgium, especially the provinces of Liége, Arlon, and Namur. They are descendents of the Gallic Belgae and were sheltered from the German conquerors by taking refuge in the Ardennes Mountains. Ultimately their language became mixed with the French, but it still retains the greater part of the Gallic. They may be said to resemble the French more closely than the German, though they surpass the former in business activity and earnestness. Their number is steadily increasing, a fact giving rise to political contests between them and the Flemish. Many of the eminent statesmen of Belgium are to be traced to Walloon ancestry. The Walloon inhabitants of Belgium and France are placed at 2,783,280.

WALL PAPER. See Paper Hangings.

WALNUT (wol-nut), an extensive genus of valuable and beautiful trees, which are prized for their wood and for the edible nut borne by most of the species. Thirty species have been catalogued, the larger number of which are native to America. The black walnut is the most valuable species found in Canada and the Unied States, although the nuts are inferior for the market to those of the Persian, or English, walnut, but they are richer and juicier. The wood is hard and durable, has a reddish-black color, and is of much value in the manufacture of furniture and musical instruments. Black walnut trees attain a diameter of three to six feet and a height of 40 to 75 feet. The nut matures about the first of October. It is surrounded by a thick, greenish husk, which turns black when dried. The oily kernel is inclosed in a hard shell and is used in making walnut oil, in culinary arts, and for eating. Another widely distributed species is the white walnut, or butternut, which yields a nut somewhat less flavored, and its wood is not as valuable and durable as that of the black walnut. The common walnut of Europe and Asia is a fine, spreading tree and produces excellent wood and edible nuts. These nuts are gathered in the fall and transported in large quantities. They yield the products called walnut oil and nut oil, which are used as articles of diet and by painters. In some countries the walnut oil is burned in lamps and used for the finer printing inks. The wood is of value in making gunstocks and furniture and for construction purposes.

WALPOLE (wŏl'pōl), Horace, author, born in London, England, Oct. 5, 1717; died March 2, 1797. He was the youngest child of Sir Robert Walpole, studied at Eton and Cambridge and in 1739 went on an extended tour of continental Europe. In 1741 he was elected to Parliament, where he held a seat until 1768, though his political career is not distinguished by brilliance or activity. He had secured an estate from his father valued at \$25,000 per year and in 1746 purchased the villa of Strawberry Hill, a beautiful home overlooking the Thames, at Twickenham, near London. This he adorned with paintings and enriched his library with all the books and manuscripts that his literary taste craved. He succeeded to the peerage in 1791, with the title of Earl of Orford, but never took his seat in the House of Lords. His writings are very numerous, though his fame rests upon his "Letters," the result of extended correspondence with public men. They so closely touch the events of his time that they may be regarded a fine addition to English literature. Other writings include "The Castle of Otranto," "Memoirs of the Reign of King George III," "The Last Ten Years of the Reign of George II.," "Catalogue of Noted Engravers," "Mysterious Mother," "Catalogue of Royal and Noble Authors," and "Historic Doubts on the Life and Reign of Richard III.'

WALPOLE, Sir Robert, Earl of Oxford, statesman, born at Houghton, England, Aug. 26, 1676; died March 18, 1745. He studied at Eton and Cambridge and in 1701 entered Parliament In 1707 he was made Secretary of War and in 1709 became Treasurer of the Navy. His ability and zeal were alike noted. but his desire to overcome political opponents caused him to be charged with corruption, and in 1712 he was expelled from the house and committed to the Tower. He became privy counselor when George I. ascended the throne, and afterward was made First Lord of the Treasury. Walpole was noted as an influential member of the Whig party and his powers were exercised to establish the Hanoverian succession. His support of the German party caused such opposition among his political opponents that he was compelled to resign in 1717, but he was recalled to office in 1721, and from that time until 1742 was the Prime Minister of England. He resigned in 1742 and was made Earl of Orford, with a pension of \$20,000 per year. Shortly after charges of corruption were brought against him, but the proceedings were dropped for want of evidence. Walpole exercised an influence for good, chiefly by promoting a policy leading to the commercial development of Great Britain, and relieved taxation by wholesome reforms in the tariff laws.

WALPURGIS (väl-poor'ges), or Walpurga, the name applied in Germany to the eve of

May 1, when, according to legends, the witches were supposed to assemble at some appointed rendezvous, such as the highest point of the Hartz Mountains. The legends of Walpurgis Night had their origin in the 8th century, when Saint Walpurgis established convents and several societies in that country. The reason that May 1 was named as the day to commemorate her is that a heathen festival was formerly held at that time and her feast was appointed to take its place, though it properly should be held on Feb. 25.

WALRUS (wŏ1'rūs), Morse, or Sea Horse, an animal resembling the large seals, but it has dental affinities with the ungulates. The skull is large and the facial portion is quite long. The hind limbs are flexible, serving to propel the animal in moving in the water, and tusk-like canines extend from the upper jaw. It has no external ears, but the sense of hearing is quite well developed. The eyes are small, the body is large and sacklike, and the fur is principally of a tawny-brown color. Its hide is so



WALRUS.

tough that bullets penetrate it with difficulty. The fore paws are webbed, having a horny protective covering, and are two or three feet long. Walruses are carnivorous mammals, feeding on bivalve mollusks, which they obtain by digging with their tusks. They are usually found near the coast on floating ice. The males reach 12 to 20 feet in length and weigh from one to two tons, but the females are somewhat smaller. The blubber yields excellent oil and the skin is of value in making a durable leather, used largely in manufacturing machine belts. A hard, white ivory is obtained from the tusks, which weigh three to six pounds. The walrus is gregarious and inoffensive, but becomes desperately aggressive when attacked. These animals are native to the arctic regions of both hemispheres, where they are hunted for their skins and blubber. The Eskimos value their flesh for food. Siberia, the Aleutian Islands, Baffin Bay, and Spitzbergen have valuable walrus fisheries.

WALSALL (wol'sal), a city of England, in Staffordshire, seven miles northwest of Birmingham. It has canal and railway connections with other trade centers. The surrounding country contains valuable deposits of coal, iron, and limestone. It has public baths, electric street railways, sanitary sewerage, a municipal library, and many fine schools and churches. Among the manufactures are ironware, clothing, flour, bolts, locks, carriages, and machinery. The principal streets are regularly platted, but those in the older part are crooked and illy improved. Ethelfleda, daughter of Alfred the Great, fortified Walsall, and it subsequently passed to William the Conqueror and to the Duke of Northumberland. Though long a manufacturing city, its prosperity dates from the time railroads were built to connect it with other trade centers. Population, 1911, 92,130.

WALSINGHAM (wöl'sing-am), Sir Francis, statesman, born in Chiselhurst, England, in

1536; died April 6, 1590. He first studied under private tutors. Later he entered the University of Cambridge, but left that institution before graduating to make an extensive tour of Europe. Queen Elizabeth sent him on several important missions to France, in which he negotiated terms for the toleration of the Huguenots. In 1573 he was made one of the secretaries of state to Elizabeth. He was sent on an important embassy to the Netherlands in 1578 and to Scotland in 1583. While serving in the latter capacity he obtained possession of some of the letters written by adherents of Mary, Queen of Scots, and by them became enabled to discover the

Babington conspiracy to murder Queen Elizabeth. Friends of Queen Mary charged Walsingham with being an accomplice in bringing her to the block on forged evidence, but this charge was not proven, though it is known that he regarded her execution of interest in furthering the scheme to make Scotland permanently subject to England. He had become surety for the debts of Sir Philip Sydney, whereby he became so heavily involved that he died in extreme poverty, and his friends buried the remains in Saint Paul's at night to save the expenses incurred by a public funeral. His writings were published under the title, "The Complete Ambassador."

WALTER (wal'ter), Thomas Ustick, architect, born in Philadelphia, Pa., Sept. 4, 1804; died there Oct. 30, 1887. He studied architecture in the office of William Strickland, architect of the mint and customhouse of Philadelphia. In

1847 he completed the main building of Girard College, which is thought to be the finest specimen of classic architecture in America. The government employed him in 1851 to design an extension of the capitol at Washington and later to make additions to the treasury, the patent office, the post office, and the congressional library buildings. Another important work by Walter is a breakwater constructed for the government of Venezuela at Laguayra. He was a member of the American Philosophical Society and of the Franklin Institute and president of the American Institute of Architects. Harvard University conferred a degree upon him in 1857

WALTHAM (wol'tham), a city of Massachusetts, in Middlesex County, on the Charles River, ten miles west of Boston. It is on the Boston and Maine Railroad, has electric railway facilities, and is the seat of a Swedenborgian theological seminary. Among the noteworthy buildings are the public library, the Waltham Hospital, the Notre Dame Normal School, the Leland Home for Aged Women, and the Massachusetts School for the Feeble-Minded. Prospect Hill Park is a fine public resort. The manufactures include cotton and woolen goods, hosiery, watches, furniture, boots and shoes, clothing, and machinery. Waltham has many excellent residences and is the seat of a large trade. It is particularly noted for the manufacture of the Waltham watches. The place was chartered as a city in 1884. Population, 1905, 26,239; in 1910, 27,834.

WALTHER (väl'ter), Carl Ferdinand Wilhelm, theologian and author, born in Langenchursdorf, in Saxony, Germany, Oct. 25, 1811; died in Saint Louis, Mo., May 7, 1887. father, Gottlieb Heinrich Wilhelm Walther, was a Lutheran clergyman. He received a classical education in the gymnasium at Schneeberg and afterward studied theology in the University of Leipsic, from which he graduated in 1833 with high credits. After teaching as tutor in a family at Kahla, he became pastor at Bräunsdorf, where he officiated successfully for some time. In 1838 he left Germany to seek a wider field of labor among the Lutherans of America, landing in New Orleans, La., in the early part of 1839. His first pastoral charge in America was at Altenburg, Perry County, Missouri, but in 1841 he accepted a call to a pastorate in Saint Louis, where he spent nearly a half century in fruitful Christian work.

Walther was so successful by reason of his able pulpit oratory and devotion to his work that he was enabled to dedicate the Holy Trinity Church of Saint Louis in 1842, and soon became recognized as an eminent Lutheran divine. In 1847 he was a leader in organizing the synod of Missouri, Ohio, and other states, of which he was chosen the first president. This synod is now the largest Lutheran organization in America. In 1849 he was elected president of the

Saint Louis Theological Seminary, which position he filled with eminent success until his death. The synodical conference of the Evangelical Lutheran Church of North America was organized with his active cooperation in 1872, and its work was stimulated and extended by his devoted labors. He was not only a fine classical scholar and profound theologian, but possessed a high degree of efficiency as an organizer and author. His most noted publication, "The Annotated Edition of John William Baier's Positive Theology," was issued at Saint Louis in 1879 and is counted among the most thoughtful and scholarly works in Latin written in America. Many of his sermons were published in German and English and had a wide circulation in America and Europe. Among his published works are "The Evangelical Lutheran Postil," "Speeches and Sermons," "The Voice of Our Church," "Talks and Prayers," "The Rightful Distinctions Between the Law and the Gospels," "Lutheran Epistle-Postil," "Gospels and Epistles," "Luther's Little Catechism," "Mercy-Year," and "Festival Tones." He founded Der Lutheraner, in 1844; the Lehre und Wehre, in 1854; and the Homiletisches Magazin. The first mentioned periodical was under his direct editorial charge for 43 years.

WALTHER VON DER VOGELWEIDE (väl'ter fon der fo'gel-vi-de), meaning Walter of the Bird-Meadow, famous singer, born in Tyrol, Austria, about 1168; died in Würzburg, Germany, about 1228. He descended from noble parentage, but his musical inclinations induced him to become a minstrel singer, and he may justly be classed as the greatest and most famous of the Minnesingers (q. v.). Duke Frederick of Austria employed him at his court for several years and after the death of the latter, in 1198, he visited the courts of many sovereigns of Germany, but later was retained at the court of Emperor Philip. In 1217 he was engaged at the court of Duke Leopold of Austria, with whom he remained most of the time until 1220, when he accepted an invitation to join the retinue of Englevert of Cologne. He settled at Würzburg, in 1224, where he lived in retirement until his death. Walther is the author of many excellent poems. The earlier writings consist largely of songs devoted to love and fancy, but his later productions deal with the political life of Germany and the events relating to the Crusades. Interest in his writings has been revived by many modern writers.

WALTON (wal'tun), Izaak, author, born in Stafford, England, Aug. 9, 1593; died in Winchester, Dec. 15, 1683. He passed his early manhood in London, where he engaged in the business of a linen draper. In 1643 he retired from trade with a competence for his modest desires and lived in ease to the advanced age of ninety years. He spent much time in travel and literary study and made it a point to hold a large acquaintance with clergymen. His fame

as a writer rests principally on the work entitled "The Complete Angler," a treatise on his favorite pastime of fishing. The production is in the form of dialogues carried on by a hunter, a falconer, and an angler, in which each extols the delights of his favorite sport, until the angler vanquishes the others by his eloquence and makes them his disciples. The angler next initiates the disciples into the mysteries of the gentle craft by giving racy descriptions of the fortunes of angling days. This work went through five editions in the time of Walton. It is still a popular production among English readers. Other writings include lives of distinguished contemporaries. Among them are those of Richard Hooker (1665), George Herbert (1670), and Robert Sanderson (1678). These tiographies are written with a tender grace, and are all considered masterpieces. He aided John Chalkhill in writing "Thealma and Clearchus.

WALTZ (walts), a dance of German origin, so named from the word walzen, meaning to roll. It is danced by two persons placed directly opposite and almost embracing each other, who turn round on an axis of their own, while moving in a circle, the radius of which varies with the dimensions of the room. The music is written to three-fourths time. Any number of couples may join the circle in moving round the room, or it may be danced by only one or two couples. Johann Strauss is the most famous writer of waltz music, but some of the classical masters produced compositions that are suitable but not intended for this dance. Waltzing became very popular at the beginning of the 19th century and was long the only form of round dance in vogue, but it has been supplemented by the polka, schottisch, cotillion, and twostep.

WAMPANOAG (wom-pa-no'ag), a tribe of Algonquin Indians, who occupied the region included in Massachusetts and Rhode Island. They are sometimes called Pokanoket from their principal village. A large number were killed during King Philip's War and many of the survivors fled to Canada. Those who survived were either sold into slavery or remained near Compton, R. I., but they became extinct before the beginning of the 19th century.

WALWORTH (wol'wurth), Reuben Hyde, jurist, born in Bozrah, Conn., Oct. 26, 1788; died in Saratoga, N. Y., Nov. 27, 1867. In 1809 he attained admission to the bar and shortly after began the practice of law at Plattsburg, N. Y. He served in Congress from 1821 to 1823, as circuit judge from 1823 to 1828, and as chancellor of the State of New York from 1828 to 1848. Walworth may be classed with the most eminent jurists of America, especially as an exponent of equity jurisprudence. He wrote "Rules and Orders of the Court of Chancery of the State of New York" and in 1864 published the "Hyde Genealogy," a work in two volumes. Princeton granted him the degree of law in 1835.

WAMPUM (wom'pum), the name of beads formed from the interior parts of shells. Formerly they were strung on threads and used among the American Indians as money, or were worn in necklaces, belts, bracelets, and other articles of ornament. According to tradition, wampum was first employed as money by the Narragansett Indians and afterward was generally adopted by the natives along the eastern coast as a medium of exchange. The colonists of New England and the Middle States adopted wampum as money, where it ranked as a legal tender from 1627 to 1661. Periwinkle shells, found largely along the Atlantic coast, were employed in making wampum. The inner part of the shell was made round and smooth by rubbing on a stone, and afterward holes were drilled for stringing the rounded pieces. Wampum made from black beads was called suckanhock, while those made from white beads were called wampumpeag. The former had twice the value of the latter in exchange. In many instances the beads were strung together and sewn upon belts. When making payments in wampum, individual beads were stripped off, or portions of the embroidered belts were used. These belts entered as an essential element into peace treaties and agreements.

WANAMAKER (wŏn'à-mā-kēr), John, merchant, born in Philadelphia, Pa., July 11, 1837. He attended the public schools of his native city and in 1861 established a mercantile business. His care and diligence in buying and selling made him highly successful. In 1876 he became head of the firm of John Wanamaker & Co., which conducted an immense clothing, dry goods, and miscellaneous business. He founded the Bethany Presbyterian Church, was for many years president of the Philadelphia Young Men's Christian Association, and made many subscriptions to aid benevolent enterprises, such as relieving yellow fever sufferers in the South and famine-stricken peasants in Ireland. President Harrison appointed him Postmaster-General in 1889. During the four years of his service the postal business was managed with much executive ability. He introduced the profitsharing system into his commercial business, which plan proved highly successful under his

management.

WANDERING JEW (won'der-ing jū), a name used as the subject of several legends, the character being represented as a Jew who is condemned to wander from place to place until the day of judgment. Three noteworthy legends are included in the list. The one is that of Matthew Paris, who represents him as the doorkeeper of the judgment hall, in the service of Pontius Pilate. It is related that he scorned our Lord as He was led forth, saying "Get on faster, Jesus," but the latter replied, "I am going, but thou shalt tarry till I come again." In another

legend he is represented as a carpenter making the cross for Christ, and, when the latter was pressed down with the weight of His cross, the Jew is said to have urged Him to proceed, but Jesus replied, "Truly I go away, and that quickly, but tarry thou till I come." Another legend is that the Jew was a shoemaker at his bench and refused the Savior permission to rest on his accustomed seat. In each case the subject of the legend is represented as wandering from place to place, laden with cares and tribulations, but in vain seeking death. Some of the finest illustrations by Doré are based upon the Wandering Jew. This legend was made the subject of an interesting novel by Eugene Sue. It also forms the basis of other novels and of many poems.

WAPAKONETA, capital of Anglaize County, Ohio, 85 miles south of Toledo, on the Anglaize River and on the Toledo and Ohio Central and other railroads. It has a shipping trade in cereals, petroleum, and live stock. The manufactures include furniture and machinery. It was settled in 1833 and incorporated in 1845.

Population, 1910, 5,349.

WAPITI (wap'i-ti), a species of large deer found in North America. It is closely allied to the red deer of Europe, but is considerably larger, weighing from 800 to 1,000 pounds and measuring five feet in height at the shoulders. The wapiti is commonly called *elk* in America, but it differs from the moose. See Elk.

WAR, an armed contest between nations or states, or between different parties in the same state. In the former case the contest is termed international war and is under warrant and by authority of the sovereign power of each belligerent; in the latter case it is termed civil war. Aggressive, or offensive, war is a contest which is prosecuted in the territory of the antagonist, while defensive war is an armed resistance to an attack. Wars take place principally as means of common defense, for avenging insults and redressing wrongs, to obtain and establish the superiority and dominion of one contestant over the other, and for the extension of commerce and the acquisition of territory. Savage nations wage war largely for purposes of plunder. The usual plan of conducting warfare is by the slaughter or capture of the troops and the seizure or destruction of ships, property, and towns.

Wars by savage nations and despots begin by an invasion of territory belonging to others, the incursion being without formal notice, but civilized nations take steps to secure a settlement of difficulties without employing armed force, and, when peaceable means fail, a formal notice, or declaration, of war is sent. Nations have come to recognize certain usages, laws, and rights of war during the progress of the contest, these applying both to the belligerent and neutral powers. Wars are as old as human history and those of ancient times and savage nations are particularly repulsive for the great cruelties com-

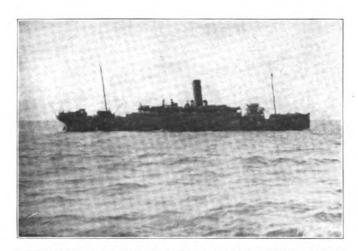
mitted. Most civilized nations have come to look upon opposing parties as enemies only so long as they actively bear arms, and when peace is attained relations of friendship and commerce are reestablished. The possibility of war is no doubt lessened by a constant readiness of the nations to conduct extensive contests, a fact accounting largely for the vast standing armies and the thorough equipments in the form of forts, battleships, and implements of war maintained by the great powers of Europe. The ambition of statesmen of the present century is and ought to be to secure equitable and stable government without encumbering the people with heavy taxes for the maintenance of extensive equipments. See Battle; Neutrality.

WAR, Department of. See United States, Departments of the.

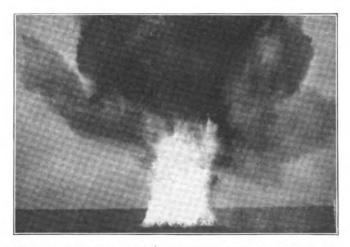
WAR, The Great European. See page 666, Volume II, Practical Home and School Methods.

WARBECK (war'bek), Perkin, British pretender, born at Tournay, England, in 1474; executed Nov. 23, 1499. He is reputed to have been the son of a Jew who lived at Tournay. In 1490 he appeared at the court of Burgundy, where he impressed all who met him with his extraordinary resemblance to Edward IV. While there he was instructed by tutors to represent Richard, Duke of York, the younger of the two princes who are supposed to have been murdered in the Tower in 1483. The opponent of Henry VII. supported him and he received encouragement from the foreign powers which were hostile to England. In 1497 he made an expedition into England and was captured and confined in the Tower, where he was allowed considerable liberty, but afterward entered a conspiracy against the government and was executed.

WARBLERS (war'blerz), the name applied to a family of perching birds, most of which are shy, small, and active. They have a clear and beautiful song. The common birds of this family include the redbreast, hedge sparrow, redstart, nightingale, bluebird, sedge warbler, and reed warbler. Most warblers are migratory and are widely distributed in all climes. They are valuable because of their activity in catching large numbers of insects, which form their chief food. The wagtail is a notable species of the warbler family and is so called from the habit of wagging the tail, when it is on the ground. It is seen mostly in pastures and meadow lands and includes several species, such as the gray wagtail, yellow wagtail, and pied wagtail. Reed warblers and sedge warblers are found mostly in marshy places, where they build nests in the reeds, usually hanging them among four or five of the larger plants by means of threads of wool or soft grasses. The family of birds called Sylviidae, confined to the Old World, includes several typical warblers. On the other hand the tanager family of birds embraces many American species.



BRITISH CRUISER PHOTOGRAPHED WHILE LAYING MINES ON THE COAST OF THE ORKNEY ISLANDS.



THE EFFECT OF A MINE EXPLODING UNDER WATER AT A DEPTH OF ABOUT TWENTY FEET.

Such a mine is capable of great destruction when exploded under or in contact with a ship.

(Opp. 2898.)

1.

WARD (ward), Artemas, soldier and jurist, born in Shrewsbury, Mass., Nov. 27, 1727; died there Oct. 26, 1800. In 1748 he graduated from Harvard University, served as lieutenant colonel in the French and Indian wars, and was a prominent member of the Massachusetts Legislature. He was made commander in chief of the Massachusetts troops, in 1775, and commanded at the siege of Boston until the arrival of Washington, when he became second in command. In 1776 he resigned on account of ill health and in the same year became president of the Massachusetts executive council. He served as a member of the Massachusetts State Legislature for sixteen years and was a Federalist Representative in Congress from 1891 to 1895. Both as a jurist and statesman he contributed largely to the welfare of the colonies, his public life being devoted to the best interests of the newly organized republic.

WARD, Artemus, the nom de plume of Charles Farrar Browne, an American humorous writer. He was born at Waterford, Me., April 26, 1834; died in Southampton, England, March 6, 1867. His first work was that of a compositor in a printing office, but he soon became a writer for several weekly and daily journals. He published the first series of writings under the name Artemus Ward in the Cleveland Plaindealer, in 1858, which he represented to be written by a traveling showman. In 1860 he became editor of a New York humorous weekly called Vanity Fair, but the enterprise of publishing it met with financial failure. Shortly after he went upon the platform as a lecturer, his eccentric humor attracting large audiences. He made a tour of England in 1866, where he became popular as a lecturer and contributor to Punch. His best known writing is "Artemus Ward: His Book."

WARD, Elizabeth Stuart Phelps.

Phelps, Elizabeth Stuart.

WARD, Henry Augustus, naturalist, born in Rochester, N. Y., March 9, 1834; died in 1906. He studied at Middlebury Academy and Williams College. In 1854 he was assistant to Louis Agassiz at the Lawrence Scientific School of Harvard University. Subsequently he studied in Paris and traveled through Europe and the Orient. He returned to the United States in 1860 and was made professor of natural science at the Rochester University, serving until 1865, when he became manager of gold mines in Montana, and in 1871 was naturalist to the United States commission in San Domingo. Subsequently he devoted much time to making large and valuable cabinets of mineralogy and geology, of which many were distributed to colleges and universities in America and Europe. He published "Description of the Most Celebrated Fossil Animals in the Royal Museums of Europe" and "Notices of the Megatherium Cuvieri."

WARD, John Quincy Adams, sculptor, born in Urbana, Ohio, June 29, 1830. He went to

Washington in 1857, where he studied sculpture, and later modeled busts of Hannibal Hamlin, Alexander H. Stephens, and others. In 1861 he settled in New York City. To secure a superior model for his bronze cast, "Indian Hunter," he visited the western frontier to study Indian life. He went to Europe in 1872 and again in 1878, and served as president of the National Academy of Design. His productions are admirable because of originality and their exhibiting the spirit of Americanism. Among his best known works are statues of General Lafayette, in Burlington, Vt.; James A. Garfield, in Washington, D. C.; Israel Putnam, in Hartford, Conn.; Roscoe Conkling, in Madison Square; Shakespeare, in Central Park; and Washington, in Wall Street. Other productions include "The Good Samaritan," "The Seventh Regiment Monument," "The Pilgrim," and statues of Henry Ward Beecher, Commodore Perry, and General Thomas. He died May 1, 1910.

WARD, Lester Frank, geologist and sociologist, born at Joliet, Ill., June 18, 1841. He studied in his native State and at the Columbian University, Washington, D. C., graduating from the latter in 1869. Subsequently he studied law, worked seven years in the United States Treasury Department, and was for some time assistant geologist under the government geological Other works include "Outlines of Sociology," is an outline of a system of cosmic philosophy quite in harmony with the theories of Spencer. Other works include "Outlines of Socialogy," "Flora of Washington," "Types of the Laramie Flora," and "Geological Distribution of Fossil Flora," and "Geological Distribution of Fossil Plants." He died April 19, 1913.

WARD, Mary Augusta Arnold, novelist, born on the island of Tasmania, June 11, 1851. She descended from English parents, being a

granddaughter of Thomas Arnold of Rugby, and at the time of her birth her father held an educational position in Tasmania. The family returned to England in 1856, where Miss Arnold, in 1872, married Thomas Humphry Ward, editor of "English Poets," "Man of the Reign,"



and "Reign of Queen Victoria." She began her literary work by writing criticisms for Macmillan's Magazine and contributions to Smith's Dictionary of Christian Biography. A pleasing story entitled "Miss Bretherton" appeared in 1884, and soon after she published a number of novels. Her later works include "The History

3082

of David Grieve," "Robert Elsmere," "Marcella," "Sir George Tressady," "Lady Rose's Daughter," "The Marriage of William Ashe," "The Story of Bessie Castrell," and "Helbeeh of Bannisdale." "Robert Elsmere" is her most successful novel. It has been translated into

many European languages.

WARE, a town of Massachusetts, in Hampshire County, on the Ware River, 68 miles west of Boston. It is on the Boston and Albany and the Boston and Maine railroads. The notable buildings include the public library, the townhall, the high school, and several fine churches. It has sanitary sewerage, rapid transit, and public waterworks. Among the manufactures are cotton and woolen goods, hardware, cigars, machinery, and clothing. Ware was settled in 1673 and was chartered as a town in 1775. Population, 1905, 8,594; in 1910, 8,774.

WAR GAME, or Kriegs Spiel, a game invented by Herr von Reisswitz, an officer in the German army. It is played with movable pieces upon a map, which is drawn upon a large scale, and the purpose is to represent a battle or campaign between two contending parties. The importance of the game was emphasized by the war with Austria, in 1866, and became popular in many countries after the Franco-German War. Now it is played extensively among the naval and military men of Europe and America, and the most popular form is to have two players on each side. The movable pieces consist of blocks that represent the troops and sustain the same relation to the field that contending forces would in real war. There are subdivisions, such as cavalry, infantry, engineers, etc. Rules govern the time and distance of the movements. Defeat or victory depends upon the number of men who come together upon the field, the stronger side attaining victory. If both sides are equal as to number and position held, a die is cast to determine the winner.

WARING (wā'ring), George Edwin, sanitary engineer, born in Poundridge, N. Y., July 4, 1833; died in New York City, Oct. 29, 1898. He was educated at College Hill, Poughkeepsie, where he pursued courses in agriculture and mining. In 1855 he lectured on agriculture in Maine and Vermont. He was drainage engineer of Central Park, New York, from 1857 to 1861. In the latter year he entered the Union army and, after serving for three months in the army of the Potomac, commanded under John C. Frémont, but later was made colonel of the Fourth Missouri cavalry. From 1867 to 1877 he managed the Ogden Farm, at Newport, R. I., and in 1879 became special agent of the Tenth United States census. He was a member of the national board of health for several years, planned a sewerage system for the city of Memphis, and served as street cleaning commissioner for New York City. President McKinley appointed him, in 1898, to investigate the sanitary condition of

Havana, with the view of introducing modern sanitation. While there he was attacked by yellow fever, of which he died shortly after returning to New York City.

WARMING AND VENTILATION, two subjects which are closely related and equally important in the economy of health. In the construction of buildings, it should be the aim of the architect to provide such facilities as will best serve to warm the apartments with the greatest possible economy and at the same time provide an ample supply of pure air for the occupants. These terms are in a sense opposed to each other, since pure air must be drawn from outside the building and the air which is on the inside must be constantly replaced by a stream of pure, fresh air. From this fact it will be seen that ventilation in a measure reduces the warmth of a room or apartment. However, both subjects must be kept in mind, as a neglect of either tends to bring on disease and eventually death. In summer warmth is supplied largely by the force of nature, thus requiring only the need of a movement and replacement of the air, but for service in winter warming and ventilation must be installed as distinct systems in most houses.

Though all persons require pure air, the temperature agreeable to them varies somewhat. This depends partly on the physical constitution and state of health and whether the body is exercised while indoors. A temperature of 68° Fahr, is found the most suitable for dwellings and schoolrooms. That ventilation is a matter of importance is due to the circumstance that the foul air passing from the lungs and outward through the pores of the skin does not fall to the floor, but becomes diffused through the surrounding atmosphere. With every breath a small quantity of carbonic acid is given off and every inspiration consumes a certain amount of oxygen; hence, without ventilation, the supply of oxygen is consumed in breathing. An oil light vitiates as much air as a dozen persons and makes impure about 75 cubic feet in an hour. Thus, many breaths and lights rapidly unfit the air for use. It should be made an object to bring the air of a room into a condition as pure as that outside. This can be accomplished only by the best known methods of ventilation when the space within the room is equal to 600 cubic feet for each person.

HEATING. Many methods have been devised in which rooms may be adequately warmed. The methods differ according to climatic conditions and the nature and cost of obtainable fuel. Open coal fires were long in favor and are still considered the most healthful. The heat is pure and quite unlike the dry, parched heat of the closed stove, steam pipe, or furnace. However, there is a marked irregularity and a considerable waste of heat where the fireplace is employed. Closed stoves were introduced to overcome the loss of heat attending open fires, but, unlike them, they do not furnish an efficient ventilator. Rooms warmed by iron stoves, burning either wood or coal, may be ventilated in several ways, as by inlet tubes and registers. Some ventilation is provided by defects in carpentry, as the cracks and crevices at doors and windows. Heating by steam and hot-water systems are now employed in many dwellings and in practically all the large public buildings, offices, and warehouses.

In steam-heating the steam passes from a boiler through pipes, which become highly heated and thus warm the rooms. Water-heating depends upon the principle of the expansion of water by heat. The pipes, which pass from a heater, are kept filled with water by a supply tank. As the water in the pipes within the heater becomes heated it begins to move upward, owing to its greater lightness when subjected to a high temperature, and colder water rushes in to take its place. Thus, a continual circulation is kept up and the apartments are warmed uniformly. Heating plants of this kind are not only popular in large edifices, but many towns and cities maintain them as a method of supplying heat to a large number of buildings. Heating by electricity is becoming popular for various purposes, especially in railway and street cars.

VENTILATING. All ordinary ventilation depends upon the fact that hot air is lighter than cold air. It is due to this fact that cold air, by the force of gravity, sinks to the lower region and forces the warm air to rise. Hence the air near the ceiling of a warmed room is warmer than that near the floor, flames ascend upward from a burning material, and the warmed smoke of a stove escapes by passing upward in the flue. Two openings are necessary to procure a change of air in a room, one for admission and the other for exit of the air. The outlet should be near the floor, opening into an air shaft, a pipe leading through the roof, with proper orifices at the top. In cases where an outlet shaft is not provided, the outlet should be near the ceiling and always larger than the inlet. Dwellings having an open fireplace are usually ventilated sufficiently, for the reason that a constant current of air sweeps up the flue. In large cities mechanical means are employed to ventilate the great structures in which hundreds of people find lodging or employment. This is done by means of flues, pipes, or shafts, and the supply of air is regulated by means of fans or pumps driven by gas, steam, or electric power. Mines are ventilated by similar methods.

WARNER (war'ner), Charles Dudley, essayist and author, born in Plainfield, Mass., Sept. 12, 1829; died in Hartford, Conn., Oct. 20, 1900. He graduated from Hamilton College in 1851, studied law at the University of Pennsylvania, and in 1854 began the practice of law in Chicago. In 1860 he removed to Hartford, Conn., to become associate editor of the Hart-

ford Press with his college classmate, Joseph R. Hawley. This publication was merged with the Hartford Courant in 1867 and he continued as co-editor. His first contributions to literature were in the form of a series of letters to the Courant while on an extensive foreign trip in Eurasia, and in the meantime he wrote articles for other periodicals. He was co-editor of Harper's Magazine from 1884 to 1898, conducting at different times the two departments known as the Editor's Drawer and the Editor's Study.

Warner was deeply interested in prison reform, and lectured on educational and literary topics. His largest work is entitled "Library of the World's Best Literature," which he edited with the assistance of a number of writers, and it was published in thirty volumes in 1895. "That Fortune," a novel, was his last work. Other writings include "Being a Boy," "My Winter on the Nile Among the Mummies and Moslems," "Captain John Smith," "Relation of Life to Literature," "In the Wilderness,"
"Washington Irving," "Roundabout Journey," "Backlog Stories," and "People for Whom Shakespeare Wrote." "Our Italy," a description of Southern California, was published by him in 1891. He joined Samuel L. Clemens in publishing "The Gilded Age."

WARNER, Seth, soldier, born in Roxbury, Conn., May 17, 1743; died in Roxbury, Vt., Dec. 26, 1784. He settled in Bennington, Vt., in 1765. At that time the region was in the New Hampshire Grants. In the disputes between the settlers and New York, Warner was one of the leaders. He was second in command at the capture of Ticonderoga, when that place was taken by Ethan Allen, and on the following day captured Crown Point, for which he was made a colonel by Congress. He participated with Montgomery in the Canada campaign, took part in the Battle of Bennington, and continued in the service until compelled by ill health to resign, in 1782. Olin Levy Warner (1844-1896), the sculptor, is his great-grandnephew. Among his chief works are "Twilight," "Diana," "May," and "The Dancing Nymph."

WARNER, Susan, authoress, born in New York City, July 11, 1819; died in Highland Falls, N. Y., March 17, 1885. Her first novel, "The Wide, Wide World," was published in 1851 under the pen name of Elizabeth Wetherell. This production has been highly popular in the United States, fully 275,000 copies having been sold, and its saie in Europe has been quite as large. Other writings embrace "Melbourne House," "Story of Small Beginnings," "Kingdom of Judah," "Hills of the Shatemuo," "Daisy Plains," and "The Law and the Testimony."
"The Wide, Wide World" is regarded one of the most popular novels next to Stowe's "Uncle

Tom's Cabin."

WAR OF 1812, the name of an armed conflict between Great Britain and the United

States, sometimes called, in the latter country. the second war of independence. The causes which led up to this war may be traced back to the attitude assumed by Great Britain immediately after the Revolutionary War in treating the new republic, especially in relation to the American foreign trade. Great Britain held to the view that "once an Englishman always an Englishman" and maintained the right to interfere with the American vessels on the high seas and search for seamen claimed to be British subjects, who were taken from them and impressed to serve in the British navy. Several men-of-war were fired upon and compelled to give up seamen in their crew, and those who refused to serve were imprisoned. In addition to claiming the right of impressment, England issued orders to interfere with the American commerce by prohibiting trade by any neutral vessels with the dependencies of any nation with whom she was at war. This greatly interfered with American trade, since France and England were engaged in a war at that time. In 1807 Napoleon had issued the Milan Decree, forbidding commerce of any nation with England or her colonies, and it appeared that the United States would become involved with both countries. However, the proximity of Canada and the desire of France to retain the friendship of America caused Napoleon to revoke his decree, in 1810, and commercial intercourse between the two countries was resumed.

James Madison had in the meantime been elected President as the candidate of the Democratic party, but he was not disposed to favor warlike measures, while his party advocated an aggressive policy against Great Britain. It was said of the President that he "could not be kicked into a war," but the Congress that assembled in December, 1811, passed acts to increase the army and navy and made large appropriations for offensive action. The President finally declared war against Great Britain, on June 18, 1812. This was followed five days later by the withdrawal of the "Orders in Council" by the British, which has established a blockade of European ports and thus excluded American commerce to a large extent. However, the United States was not prepared for war, having made little headway in building up means of offense and defense, while Great Britain had just emerged from a war with France and, therefore, was ready to take decisive action.

An invasion of Canada was the first act of open hostility, but the enterprise proved signally unsuccessful. General Hull, Governor of Michigan Territory, at the head of 2,000 men, was operating against the hostile Indians in the Northwest when war was proclaimed. He had been invested with power to invade Canada and on July 12 crossed the Detroit River with the view of capturing the British post at Walden. General Brock captured a detachment sent out

to guard the provisions coming to the American camp and Hull decided to retreat to Detroit without striking a blow. The British were reinforced by a force of Indians under Tecumseh and proceeded to attack Detroit. General Hull, without offering to make resistance, surrendered the fort, with its garrison and stores, to the British on Aug. 16. He was afterward convicted for cowardice and sentenced to be shot, but the President pardoned him in view of his previous services. The second attempt to invade Canada was undertaken by General Van Rensselaer with a force of militia, principally from New York. On Oct. 13 he crossed the Niagara River with a part of his troops and made an attack on Queenston Heights. After gaining possession of the British battery, when General Brock was mortally wounded, the Americans were compelled to retreat, having lost many of their men.

The Americans were more successful in their naval engagements during the first year of the war. Capt. Isaac Hull on Aug. 19, with the frigate Constitution, overtook and permanently disabled the British vessel Guerriere off the coast of Massachusetts, and the latter vessel was blown up the following day. On Oct. 18 the American vessel Wasp captured the Frolic, but the British gun ship Poictiers soon after captured the Wasp. In the same month Commodore Decatur, commander of the frigate United States, captured the British Macedonian. Captain Porter, the following month, with the Essex, pursued the British packet Nocton and captured it and its cargo, which included \$55,000 in specie. In the same month Commodore Bainbridge, with the Constitution, destroyed the British vessel Java and took its crew prisoners. President Madison was reëlected in the fall of 1812 and Elbridge Gerry was chosen Vice President

The Americans undertook a third invasion of Canada at the beginning of 1813. General Dearborn, at the head of 1,700 men, captured York, but was soon recalled and superseded by General Wilkinson, who was joined by a force under General Hampton and the two made a combined attack upon Montreal. The object sought was not attained, but the two armies wintered in Canada. In May the British invaded the State of New York, but they were defeated at Sackett's Harbor. General Harrison built Fort Meigs, on the Maumee, where he was besieged by a force of British and Indians under Proctor, but large numbers of the Indians deserted, and the British abandoned the siege and retreated to Malden. In the meantime Commodore Perry undertook to get control of Lake Erie, which was commanded by a British squadron of six vessels under Commodore Barclay. In September he made an attack upon the British near Put-in-Bay, where he won a complete victory. This destruction of the most important British

fleet upon the Great Lakes enabled the Americans under General Harrison to undertake the fourth invasion of Canada. He pursued the British under Proctor until they took a stand on the Thames River, where they were defeated after a pitched battle on Oct. 5. General Jackson was sent with a force of Americans into Alabama, where the Creeks had taken up arms, and they were completely defeated at Horseshoe Bend in January, 1814. After the battle of the Thames, General Harrison was transferred to Buffalo, where he resigned. The year 1813 closed without decisive results, except that Captain Lawrence, who had been made Commander of the Chesapeake, was defeated and slain in an engagement with the British vessel Shannon, commanded by Captain Broke.

Another invasion of Canada was undertaken in the spring of 1814. Three thousand Americans under Generals Scott and Ripley crossed the Niagara early in July and soon captured Fort Erie. They were met by the British under General Rial near the Chippewa River, where they won a victory, and the British retreated to Burlington Heights. The Battle of Lundy's Lane, the hardest fought engagement of the war, occurred on July 25. Each side lost about 800 men and neither gained material advantages, but the Americans withdrew to Fort Erie, where they were besieged until in September, when the British works were carried. The British under General Drummond retreated to Fort George, while the Americans went into quarters at Black Rock and Buffalo. In September, 1814, the British under General Prevost invaded New York by way of Lake Champlain. His fleet was defeated near Plattsburg under Commodore McDonough and the land forces were repulsed about the same time. However, the British ascended Chesapeake Bay, defeated the Americans at Bladensburg, and captured the city of Washington, where the government buildings were sacked. Many people of New England were opposed to the war and sent delegates to a convention at Hartford, Conn., where they published an address after a secret session of three weeks. This session was declared disloyal by the Democrat party and the political prospects of those that took part in it were ruined.

Spain sympathized with Great Britain during the War of 1812, and the British were permitted to fit out an expedition at Pensacola. General Jackson proceeded against that point and expelled the British from Florida. Having learned that the British were landing at New Orleans and preparing to conquer Louisiana, he proceeded to undertake to drive them out, being supported by 2,000 Tennessee riflemen. Four miles below the city, at Chalmette, he took a strong position. The British were under command o. General Pakenham, who had arrived with reënforcements and taken command of the British troops. Several attacks were made

at different times, but the final battle occurred on Jan. 8, 1815, when the British were defeated with heavy losses, including Generals Pakenham and Gibbs. This battle was fought two weeks after peace had been concluded, but this was unknown to the contending parties at New Or-The war ended with the Treaty of Ghent, in Belgium, and both countries received the news with deep satisfaction. No mention was made of the issues that brought on the war. The treaty was devoted chiefly to the settlement of unimportant boundaries and the possessions of small islands in Passamaquoddy Bay.

WARRANT (wor'rant), in law, a writ which gives an officer an authority over the persons or property of others. The term is more frequently applied to writs for the arrest of persons, which may be issued by a justice of the peace or under the order of a higher court or the grand jury. A search warrant gives authority to an officer to search private premises for specified goods or property belonging to another. The term bench warrant is applied to an order issued by the

judge for the arrest of a person.

WARRANTY, in law, a term used in distinct connections, especially to indicate a covenant on the part of the grantor in the conveyance of title to real property. An instrument of this kind is called a warranty deed. The term applies in insurance to indicate an undertaking on the part of the insured that certain alleged facts are as he represents them to be. In the sale of personal property the term warranty indicates that the seller guarantees the title or the quality of the property sold. Such warranties may be either expressed or implied.

WARREN (wor'ren), a city in Ohio, county seat of Trumbull County, on the Mahoning River, 52 miles southeast of Cleveland. It is on the Erie, the Pennsylvania, and the Baltimore and Ohio railroads. Warren is surrounded by a rich farming and dairying country, which contains deposits of bituminous coal, iron ore, petroleum, and building stone. The noteworthy buildings include the county courthouse, the public library, and a number of fine churches. Gas and electric lighting, pavements, waterworks, and rapid transit are among the municipal facilities. The manufactures include furniture, flour, cigars, woolen goods, and wearing apparel. It has an extensive trade in farm produce and merchandise. The place was settled in 1799 and incorporated in 1834. Population, 1910, 11,081.

WARREN, a city in Pennsylvania, county seat of Warren County, on the Allegheny River, ninety miles south of Buffalo, N. Y. It is on the Pennsylvania and other railroads and is in close proximity to the oil and coal regions of the State. The principal buildings include the public library, the county courthouse, the high school, and the Pennsylvania Hospital for the Insane. Among the manufactures are boilers, farming implements, flour, furniture, hardware,

carpets, cotton and woolen goods, and machinery. Electric lighting, pavements, and public waterworks are among the utilities. The surrounding country produces large quantities of fruit and dairy products. It has a growing trade in cereals and other produce. The place was settled in 1795 and incorporated in 1832. Population, 1900, 8,043; in 1910, 11,080,

WARREN, a town of Rhode Island, in Bristol county, ten miles southeast of Providence. It is situated on Narragansett Bay and on the New York, New Haven and Hartford Railroad. The chief buildings include the public high school, several fine churches, and the Hall Library. It has manufactures of cotton goods, clothing, braid, earthenware, and machinery. Warren occupies the site of Sowams, an Indian village in which Massasoit resided. The first settlement by whites was made in 1635 and it was incorporated in 1746. Population, 1905,

5,613; in 1910, 6,585.

WARREN, Gouverneur Kemble, soldier, born at Coal Springs, N. Y., Jan. 8, 1830; died Aug. 8, 1882. He graduated at West Point in 1850 and was connected with the corps of topographical engineers in the western states for several years. In 1859 he was chosen professor of mathematics at West Point, but became colonel of volunteers at the beginning of the Civil War. Gallant service at Gaines's Mill caused him to be promoted brigadier general in 1862. Afterward he distinguished himself at Malvern Hill, Fredericksburg, Gettysburg, in the Wilderness, and at the siege of Petersburg. In 1865 he was brevetted major general in the regular army and as major of engineers had charge of surveys and harbor improvements. He published several books relating to his public services.

WARREN, Joseph, physician and soldier, born in Roxbury, Mass., June 11, 1741; slain in the Battle of Bunker Hill, June 17, 1775. He graduated from Harvard University in 1759 and, after studying medicine, settled in Boston to practice his profession. Immediately after the Boston massacre of March 5, 1770, he was made one of the committee of safety and in 1774 was president of the provincial congress. That body made him a major general, but he preferred to fight as a volunteer. He took a prominent part in the Battle of Bunker Hill and, while endeavoring to rally the militia, was struck by a ball in the forehead and was killed instantly. Warren was noted as an orator and delivered two memorable orations on anniversaries of the Boston massacre. On June 17, 1857, a statue by Henry Dexter was erected to his honor at Bunker Hill.

WARREN, William Fairfield, educator and theologian, born at Williamsburg, Mass., March 13, 1833. He graduated from the Wesleyan University, Middletown, Conn., in 1853, and studied in Andover Theological Seminary and the universities of Berlin and Halle. In 1855

he became a minister of the Methodist Church, being connected with the New England conference until 1861, when he was made professor of theology in the Methodist Episcopal Institute at Bremen, Germany. After five years he became professor of systematic theology in the Boston School of Theology and was chosen president of the Boston University in 1873, serving until 1903, when he became dean of the School of Theology, Boston University. His publications are very numerous, including chiefly works on comparative theology and the philosophy of religion. They include "In the Footsteps of Arminius," "True Key to Ancient Cosmology," "The Story of Gottlieb," "Paradise Found-the Cradle of the Human Race at the North Pole," "Religions of the World and the World Religion," and "Constitutional Law Questions of the Methodist Episcopal Church."

WARRENSBURG (wor'renz-burg), a city of Missouri, county seat of Johnson County, on the Black River, 65 miles southeast of Kansas City. It is on the Missouri Pacific Railroad and is surrounded by a fertile farming region. In the vicinity are mineral springs and deposits of blue sandstone. The manufactures include flour, woolen goods, farming implements, hardware, and machinery. Among the features are the county courthouse, the Masonic Temple, the opera house, the high school, the State normal school, and the Pertle Springs Park. It has public waterworks, sanitary sewerage, and well-graded streets. The place was settled in 1835 and incorporated in 1856. Population, 1900, 4,724; in 1910, 4,689.

WARSAW (war'sa), a city of Russia, capital of the government of Warsaw, on the Vistula River, 650 miles southwest of Saint Petersburg. It is the converging center of a number of important railroads and has good transportation facilities by several canals and the Vistula River. Many bridges cross the river and connect the city with the suburb of Praga. The older parts of the city have narrow and irreguular streets, but as a whole it is one of the most pleasant cities of Western Europe, and ranks next to Moscow and Saint Petersburg as the most beautiful city of Russia. The street, are paved substantially. They are supplied with all the modern improvements, such as sidewalks, gas and electric lights, sewerage, waterworks, rapid transit, and extensive telephone systems.

Warsaw has many beautiful buildings, including about thirty palaces and the Cathedral of Saint John, a substantial structure dating from 1250. The Lutheran Church is the loftiest building of Warsaw and contains fine paintings and a number of connected chapels. It has a large group of other churches and synagogues, excellent public and private schools, numerous hospitals and charitable institutions, and several important scientific and educational associations.

The University of Warsaw, founded in 1816, has fine botanic gardens, an observatory, a museum, and a library of 475,000 volumes. It is attended by 1,350 students. Many beautiful monuments, statues, parks, and gardens adorn the city. The principal streets are beautified by large, substantial, and artistic architecture. Among the manufactures are cotton and woolen goods, boots and shoes, carpets and clothing, leather and saddlery, wagons and carriages, musical instruments, silver-plated ware, spirituous liquors, cigars, chemicals, engines, and machinery. The general export trade is very extensive.

It is not certain when Warsaw was founded, but its history since the 16th century is closely connected with that of Poland. The Swedes and Russians contended for its possession throughout the 17th century. It was greatly improved by the Germans under Augustus II. and Augustus III. Russia came into possession of it in 1764, but it was annexed to Prussia in 1795, and was occupied by the French under Napoleon in 1806. The Treaty of Tilsit made it the capital of the independent duchy of Warsaw, but it was taken by Austria in 1809 and was annexed permanently to Russia in 1813. An unsuccessful insurrection occurred in 1830-1831, which was followed by the confiscation of numerous estates and the deportation of many insurrectionary leaders to Siberia. A severe military rule was maintained until 1856, but another general insurrection occurred in 1863. movement was put down with much energy by the Russians, who closed the scientific and educational institutions, deported many of the leaders to Siberia, and confiscated the landed interests of the nobles. It has been the continued policy of Russia to supplant the Polish language with the Russian and thereby crush the spirit of independence that has for centuries animated the Poles. The city has grown in population and commercial interests with a remarkable regularity for the past quarter of a century. In 1915 it was captured by the Germans after a short siege. The inhabitants include about 95,000 Germans and a large number of Jews. Population, 1914, 968,741.

WAR SHIP, the general name applied to any vessel that is armed and equipped for purposes of war. The first element considered by the naval architect in designing a war ship is its displacement, by which is meant the actual weight of the ship. This is of course exactly equal to the weight of water which the vessel displaces and in the judgment of the architect is distributed among the several parts. A portion is allotted to the hull, part to the motive power, and various proportions to the guns, stores, fuel, armor protection, and general equipment. Whatever excess is given to one element must be deducted from another, since the ship would otherwise exceed the desired displacement. Some ele-

ments in a ship of a given size cannot be varied greatly, such as the weight of the hull, stores, and furnishing, but considerable latitude may be exercised in planning the engines, armour, and fuel supply, depending upon the type of vessel that is under consideration.

In a fast-sailing ship, which has a speed of 23 knots, a large proportion of the weight is allotted to the motive power, hence the vessel can have a comparatively light battery of guns and slight armor protection. On the other hand, a more heavily armed and armored ship must necessarily have comparatively less speed, possibly from 20 to 21 knots, since the weight saved on the motive power enters into a more complete protection for the guns and heavier armament. A ship that has a speed of from 15 to 17 knots an hour, while losing in rapidity of movement, gains in the manner of greater protection and carries heavier guns and greater stores. Ships that are swift, but are lightly armed and armored, belong to the class known as protected cruisers, while the less speedy, but more heavily armed and armored ships, are classed as armored cruisers. A battleship is slowest in speed, but it has the capacity for taking and giving the heaviest blows that can be inflicted by modern guns. At present the tendency is to sacrifice speed for the power of offense and defense, but most governments supplement the more powerful ships with vessels of higher speed so as to build a fleet that contains representatives of both classes.

The British battleship Dreadnaught, completed in 1906, is one of the most powerful war ships afloat at present. It has a speed of 21 knots an hour, with a displacement of 18,500 tons, and was constructed at a cost of about \$8,000,000. On the upper deck are ten 12-inch guns, so located that six can be fired either ahead or astern, and eight may be fired broadside. In addition to these it carries eighteen 3inch guns as a means of defense against torpedo boats and other smaller vessels. With this powerful war ship may be compared the Connecticut of the United States navy, launched in 1904. It has a displacement of 18,000 tons, with a speed of 18 knots, and cost about \$4,500,-000. The length of this vessel is 456 feet and its breadth is 77 feet. It is protected by Krupp armor eleven inches thick amidships, whence it tapers to nine inches below the water line. It is equipped with four 12-inch breech-loading guns, two of which are located within a turret at each end of the ship, and twelve 7-inch guns are dispersed in casemates along the turrets. It is further supplied with numerous other guns for offensive and defensive action, such as rapidfiring guns and torpedoes. The Connecticut, at the time of being launched, was the most powerful vessel of the United States navy. While it is inferior in speed to the Dreadnaught, it is considered by many at least equal to the latter

as a forceful implement of warfare. More recently many vessels of the *Dreadnaught* type have been launched by Germany, Japan, and the United States, such as the *Michigan*, the *South Carolina*, and the *Oklahoma* of the last named country. See Navy; Ship, etc.

WARTBURG, a famous castle of Germany, in Saxe-Weimar, near the city of Eisenach. It first became famous on account of the War of the Wartburg, a name given to a poetic contest held here about 1206, in which the Minnesingers, including Walther von der Vogelweide, were the contestants. The castle was occupied at that time by Hermann, landgraf of Thuringia, who made his court a refuge for musicians, scholars, and artists. A second circumstance that made the castle famous is that it was the scene of the legend of Saint Elizabeth of Hungary, who was the wife of a Thuringian landgraf. The next and greatest of all important events is that connected with the life of Luther, who occupied rooms in the castle after the famous diet of Worms, when he translated the Bible into German. In 1867 the 8th century of its foundation was made the occasion of a general celebration. The 300th anniversary of the Reformation was celebrated at Wartburg by German students in 1817.

WARTHE (vär'te), a river of Germany and Poland, the largest tributary of the Oder. It rises in the western part of Poland, 35 miles northwest of Cracow, and, after a course of 540 miles toward the northwest, joins the Oder about 20 miles north of Frankfort. The Warthe is navigable for 250 miles and its importance is greatly enhanced by several canals. Its valley is a highly fertile region, producing grasses, sugar beets, cereals, and fruits.

WART HOG, an animal of the swine family, which is native to Southern Africa. It is peculiar because of having several warty growths



WART HOG.

on each side of the face and tusks in both jaws, which curve upward and outward. The tusks are an enlargement of the molar teeth, and their composition is similar to that of the tusks of an

elephant. Wart hogs have a large head and feed on roots and bulbs of plants. The river, or water, hogs of Central Africa are allied animals, but are peculiar for spending much of the time in water. They are savage and ill-looking. The flesh of both species is esteemed as food.

WARWICK (war'wik), a town of Rhode Island, in Kent County, five miles south of Providence. It is situated on Narragansett and Cowesett bays, the Providence and Pawtuxet rivers, and on the New York, New Haven and Hartford Railroad. The chief industries include machine shops, foundries, cotton mills, and canning and curing establishments. Among the public utilities are electric and gas lighting, waterworks, sewerage, and electric street railways. The streets are improved with pavements and avenues of shade trees. It has an extensive trade in merchandise and manufactured prod-The first settlement in the vicinity was made in 1642, when it was known as Shawomet, and was later named in honor of the Earl of Warwick. It is the birthplace of Nathaniel Greene. Population, 1910, 26,629.

WARWICK, Richard Neville, Earl of, an English nobleman, born in 1428; slain in the Battle of Barnet, April 14, 1471. His father. Richard Neville, was an Earl of Salisbury, and the son became Earl of Warwick by his marriage to the daughter of the Earl of Warwick. By this marriage he came into possession of the vast estates of the Warwick family. Accordingly he was reputed the most powerful noble in England and exercised such influence in public affairs that he became known as the King Maker. He first sided with the Duke of York in the War of the Roses, and his services at the Battle of Saint Albans were rewarded by the governorship of Calais. It was through his influence that Edward IV. became King of England, on June 22, 1461, instead of Henry VI., but when the former married Elizabeth Woodville, the earl married his own daughter to young Edward, son of Henry VI. Subsequently he went over to the Lancaster party under Queen Margaret, with the expressed condition that his son-in-law should become successor to the throne. Accordingly Henry VI. was restored and Edward IV. fled to Holland, but the latter returned to England with an army and defeated the forces of Warwick in the Battle of Barnet. It is said of Warwick that he entertained 30,000 guests daily and owned 100 manors. He is frequently spoken of as the Last of the Barons.

WASHBURN (wŏsh'būrn), a city of Wisconsin, county seat of Bayfield County, sixty miles east of Superior. It is situated on Chaquamegon Bay, an inlet of Lake Superior, and on the Northern Pacific and the Chicago, Saint Paul, Minneapolis and Omaha railroads. The city has a fine harbor and is the center of a large trade in grain, lumber, and building stone. The chief buildings include the public library, the

high school, and the county courthouse. It has manufactures of lumber products, clothing, cigars, spirituous liquors, and machinery. Near the city is a large dynamite plant. Electric lighting, waterworks, and sewerage systems are among the public utilities. The first settlement in the vicinity was made in 1665, when a Jesuit mission was established here, which was one of the first settlements in the State. Population, 1905, 7,284; in 1910, 3,830.

WASHBURN, Cadwallader Colden, soldier and capitalist, born in Livermore, Me., April 22, 1818; died May 14, 1882. He removed to Iowa in 1839, but later settled in Illinois, where he studied law. In 1842 he began to practice his profession at Mineral Point, Wis., where he gave special attention to banking and the real estate business. His investments in timber lands and flouring mills proved highly profitable. He was elected to Congress in 1854 and served consecutively until 1861, when he raised a force of volunteers to be mustered into the Federal service in 1862. During that year he served under General Curtis in Arkansas, was promoted to the rank of brigadier general, and soon after was made a major general. Besides commanding at Haines's Bluff, Miss., he took part in the campaign against Vicksburg. In 1866 he was elected to Congress, serving until 1871, and the following year was elected Governor of Wisconsin. He built an observatory at the University of Wisconsin and is the founder of an orphan asylum at Minneapolis, Minn.

WASHBURNE, Elihu Benjamin, statesman, born in Livermore, Me., Sept. 23, 1816; died in Chicago, Oct. 22, 1887. In 1833 he entered the office of the Christian Intelligencer with the view of becoming a printer and two years later engaged as a printer on the Kennebec Journal, at Augusta. Subsequently he studied law at Harvard Law School and, after being admitted to the bar, in 1840, engaged in the law practice at Galena, Ill. He was elected to Congress in 1852, serving in that body until 1869. His long service caused him to be called the Father of the House, and his close scrutiny of all bills appropriating public funds gave him the name, Watchdog of the Treasury. Among the bills opposed by him with great persistence were those granting subsidies to railroads, those appropriating public lands, and the bill making the government claim on the Union Pacific Railroad subordinate to private mortgages.

President Grant mace him Secretary of State in 1869, but he resigned that office to become minister to France. The Franco-German War occurred within that period and he gained the friendship of both the Germans and French in giving protection to those unable to leave Paris. Emperor William I. of Germany conferred upon him the Order of the Red Eagle in recognition of his services, but this he declined on constitutional grounds. He published "Recollections

of a Minister to France." His brother, Cadwall-ader C. Washburn, was a distinguished soldier in the Civil War and his brother, Charles Ames Washburn (1822-1889), is celebrated as a scholar and diplomat and served as commissioner to Paraguay in 1861. The last mentioned published "History of Paraguay," "From Poverty to Competence" and "Political Evolution."

WASHBURNE, William Drew, statesman, born in Livermore, Me., Jan. 14, 1831; died July 29, 1912. He was U. S. Senator from 1889 until 1895, where he was a recognized leader on the Republican side. Washburne was interested in large flouring and manufacturing enterprises in Minneapolis, promoted the Minneapolis Water Power Company, and served as president of the Minneapolis and Saint Louis Railroad. He supported Lincoln throughout the war.

WASHINGTON (wosh'ing-tun), a city in Indiana, county seat of Daviess County, twenty miles east of Vincennes, on the Evansville and Terre Haute and the Baltimore and Ohio Southwestern railroads. It is surrounded by a fertile farming and dairying country. The chief buildings include the public library, the county courthouse, and many fine schools and churches. Among the manufactures are earthenware, cigars, machinery, clothing, and hardware. Large quantities of bituminous and cannel coal are mined in the vicinity. The city has a large trade in grain, coal, flour, lumber, and live stock. It is improved by electric lights, waterworks, pavements, and street railways. Population, 1900, 8,551; in 1910, 7,854.

WASHINGTON, a city of Iowa, county seat of Washington County. 65 miles southwest of Davenport. Transportation facilities are provided by the Chicago, Burlington and Quincy, the Chicago, Milwaukee and Saint Paul, and the Chicago, Rock Island and Pacific railroads. It is surrounded by a fertile farming and stock raising country. The features include the county courthouse, the high school, the public library, and municipal waterworks. It has manufactures of flour, earthenware, and machinery. Population, 1905, 4,489; in 1910, 4,380.

WASHINGTON, county seat of Beaufort County, N. C., 127 miles east of Raleigh, on the Pamlico River and on the Atlantic Coast Line Railroad. It has a large trade in cotton, lumber, corn, rice, and fish. The features include the courthouse, high school, and postoffice. It was settled in 1726 and incorporated in 1776. Population, 1910, 6,211.

WASHINGTON, a city in Pennsylvania, county seat of Washington County, thirty miles southwest of Pittsburg, on the Baltimore and Ohio, the Pittsburg, Cincinnati, Chicago and Saint Louis, and other railroads. Deposits of natural gas and bituminous coal abound in the surrounding country, which also produces cereals and dairy products. It is the seat of Washington and Jefferson College, which was founded

as Washington Academy in 1787. Other features include the public library, the county courthouse, the Y. M. C. A. building, the Washington Female Seminary, Trinity Hall, and many fine churches. It has manufactures of flour, woolen goods, ironware, machinery, and farming implements. Electric lights, pavements, sewerage, and rapid transit are among the municipal facilities. The place was first settled in 1768, when it was known as Bassettown, but was incorporated under its present name in 1784. Population, 1900, 7,670; in 1910, 18,778.

WASHINGTON, the capital of the United States, situated in the District of Columbia (q. v.), on the Potomac River, 40 miles southwest of Baltimore. It occupies a beautiful site on the east bank of the Potomac River, about 100 miles from its entrance into Chesapeake Bay, at the junction with the Anacostia, or East Branch, and is the head of navigation and tide water. Originally the tract occupied by the city was 10 miles square, ceded by Maryland and Virginia to the Federal government, but the Virginia portion was given back in 1846, and the territory now belonging to the city comprises 70 square miles, of which about 10 square miles are water surface. Near the Potomac the land is low, but it rises gradually from the margin of the water, and the general elevation is about 100 feet, though the higher parts reach an altitude of 250 to 400 fect. Georgetown, situated in the western part of the District, is separated from the main part of the city by Rock Creek and is now frequently spoken of as West Washington. The Anacostia, or Eastern Branch, flows into the Potomac in the southeastern part of the city. Anacostia Island is a tract of land in the Potomac, opposite the mouth of Rock Creek.

DESCRIPTION. The principal streets are wide and range from 60 to 160 feet. They are paved largely with asphalt in the main parts of the city and farther out the pavements are of macadam. The sidewalks and curbs are almost exclusively of cement. Beautiful shade trees line the streets, though they are confined principally the residential sections. The broad transverse avenues that cross the streets diagonally are named after the states of the Union. At the time this arrangement was agreed upon, it was decided to name the great central avenue after Pennsylvania, the Keystone State. South of this the avenues received the names of the Southern States, the avenues which cross Pennsylvania were named after the Middle States, and those north of it were designated for the New England States. The rectilinear streets have a direction north and south and east and west with the points of the compass. Those running east and west are known by the letters of the alphabet, hence are designated North A and South A, North B and South B, etc. At right angles to the alphabetical streets are the thoroughfares that bear numbers and their house

enumeration begins at a line running due north and south through the Capitol. In this way the city is divided into four quarters, known as Northwest, Northeast, Southwest, Southeast In each section the houses are numbered upor the decimal system, that is, 100 numbers for each block. In addressing mail intended for different parts of the city, it is advisable to add after the addresses the designation of the quarter by its initials, but it is customary to omit the letters N. W. from mail intended for the Northwest section, since the greater part of the business houses are within that quarter.

TRANSPORTATION. The city has steamboat connection by the Potomac with ports on Chesapeake Bay and the Atlantic and the landing for vessels is at the foot of Seventh Street. Inland transportation is by the Baltimore and Ohio, the Pennsylvania, the Southern, the Chesapeake and the Ohio, the Atlantic Coast Line, and other railways. The Cumberland Canal extends along the Potomac River above Washington, but is not used extensively, except to some extent for freighting. Intercommunication is by a system of electric railways, which have branches to all parts of the city, and with it are connected interurban railways that extend to Alexandria, Mount Vernon, Arlington, Georgetown, Anacostia, Bladensburg, Brightwood, and many other points. Tourists have the advantage of being able to obtain excellent service by cabs and automobile conveyance to all parts of the city. North of Capitol Hill is the new Union railway station, one of the finest in the country, erected at a cost of \$4,000,000.

PARKS. More than 300 squares and reservations are formed at the intersections of the rectangular streets with the broad transverse avenues, and they are uniformly beautified by shrubs and trees, with interspersing of flowers and statuary. The most important reservations are located between Capitol grounds and the Washington Monument, known as the Mall, stretching a distance of about one mile from east to west. The entire tract is about four blocks wide and within it are the government's botanical gardens and conservatory, fine beds of flowers, native and foreign plants, and numerous substantial and imposing buildings. Extending north of the west end of the Mall are the Executive grounds, a finely improved and ornamented tract. At the north end of the Executive grounds are the private gardens of the White House, the official residence of the President. Across Pennsylvania Avenue, north of the White House, is the beautifully ornamented Lafayette Square. Originally there was no provision for additional parks, since the tracts which are included in the Mall and the small park have a total of 617 acres, but more recently Potomac Park has been added. This tract has been reclaimed from the Potomac River, contains 740 acres, and serves as a western extension of the

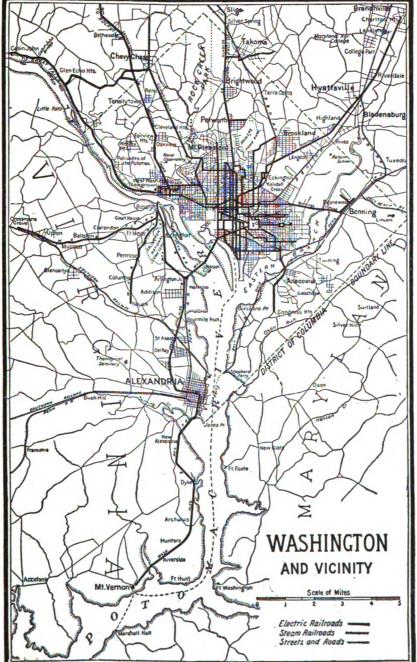
Mail. The National Zoölogical Park lies some distance north of Potomac Park, on Rock Creek, and immediately north of it is Rock Creek Park. These two parks include 1,700 acres and their

George Washington, a beautiful structure of pure white marble. It is 555 feet high, erected at a cost of \$1,187,710, and is the most lofty in the world. Within is a staircase of 900 steps,

which winds its way to the top around an interior shaft of iron pillars, within which is an elevator sufficiently large to carry 30 persons. The elevator carries sight-seers 517 feet above the ground, where the country may be viewed for a distance of 15 to 20 miles from eight small windows. Lafayette Park contains a statue of Lafayette and one of Rochambeau. A bronze group to commemorate Lincoln stands in Lincoln Park. Other memorials of beauty include those erected to Martin Luther, Daniel Webster, Benjamin Franklin, James A. Garfield, Andrew Jackson, John Marshall, Samuel Hahnemann, Nathanael Greene, Winfield S. Hancock, and Admiral Farragut. Oak Hill Cemetery, on Georgetown Heights, is the most beautiful burial ground. Rock Creek, Congressional, Mount Olivet, and Glenwood are other noteworthy cemeteries.

CAPITOL. Capitol Hill is the site of the Capitol of the United States, one of the most beauti-

ful buildings of the kind in the world. This structure stands near the center of a park, which has an area of sixteen city blocks, and is located immediately east of the Mall. The base of the



broken and picturesque aspects make them popular public resorts.

MONUMENTS. Foremost among the monuments is the one erected to the memory of

Capitol is elevated 90 feet above the Potomac. The building is 751 feet long, 348 feet wide, and above its dome, 287 feet high, is a bronze statue of Liberty. All the apartments are substantially finished and beautifully decorated. The exterior of the structure is of white marble. The largest room in the building is the hall of the House of Representatives, which contains seats for the representatives and delegates from the states and territories, and its galleries have a seating capacity for 1,650 spectators. Next to it in size is the Senate chamber, which has seats for the senators from the states and accommodations for 1,150 spectators. Other interior apartments of much beauty include the hall for the Supreme Court, the national memorial hall, and the rooms set apart for the President and the Vice President. Both of the latter are adorned with magnificent mirrors and finished in the purest of Carrara marble. Beautifully platted and finely decorated grounds surround the Capitol. Pennsylvania Avenue leads from the Capitol to the White House and may be regarded equal in beauty to any street in the world.

Buildings. About one mile and a half northwest of the Capitol is the White House, the official residence of the President. Unfortunately the beautiful grounds surrounding the White House cannot be seen from the Capitol, since the view is partly cut off by the Treasury building. The White House was built in 1792 and was first occupied by President Adams. It was destroyed by the British in 1714, but was restored four years later, and since then a number of improvements have been made. line between the White House and the Capitol are the Treasury and the Post Office departments, and west of the White House are those of the War, Navy, and State departments. The Interior Department, the Federal Printing Office, the Patent Office, and the Pension Office are located in the northwest quarter. A short distance east of the Capitol is the Library of Congress, the finest building of the kind in the world. This library contains a vast collection of books, photographs, pamphlets, pieces of music, and manuscript. The ordnance factory is a great workshop of the government, on the site of the old navy vard, and south of the Mall is the Bureau of Engraving and Printing. A short distance from the latter is the Agricultural Department, near which are the Smithsonian Institution, the National Museum, the Army Medical Museum, and the United States Fish Commission. The Washington Barracks are located on the point of land that separates the Anacostia from the Potomac River, and the government hospital for the insane is situated on the north side of the Anacostia. On the west side of the Potomac, in Virginia, is the famous Arlington National Cemetery, formerly the home of Robert E. Lee.

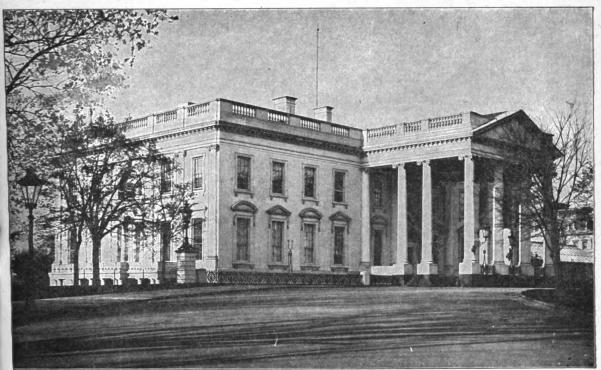
The city has many fine structures that are not

classed with those of the government. These include many business buildings and ecclesiastical structures of great value. Among the leading churches are the Church of the Covenant (Presbyterian), on Connecticut Avenue; the Saint John's (Episcopal), on Lafayette Square; the Metropolitan Memorial (Methodist), on Four-and-a-half Street; the Calvary (Baptist), at H and Eighth streets; the Lutheran Memorial, on Thomas Circle; the Christian Memorial, on Vermont Avenue; the Saint Matthew's (Roman Catholic), on Rhode Island Avenue; the First Congregational Church, at G and Tenth streets; and the Church of All Souls (Unitarian), at L and Fourteenth streets. The public library, on Mount Vernon Square, was given by Andrew Carnegie. Corcoran Art Gallery, the gift of W. W. Corcoran, on Seventeenth Street, is a beautiful structure and contains valuable works of art. Among the leading clubs are the Cosmos, the Columbia Athletic, the Chevy Chase, the Gridiron, the Army and Navy, and the Y. M. C. A. of Washington. The leading places of amusement include the Belasco, Chase's Grand Opera, the National Theater, the Academy of Music, the Kernan's Lyceum, and the Butler's Bijou. Among the principal hotels are the Montrose, the Regent, the Shoreham, the Saint Louis, the Ebbitt, the Riggs, the Willard, the Dewey. the Crafton, the Arlington, and the Cairo.

開発というないとある。

EDUCATIONAL. The public schools are well organized and generally attended, in fact the patronage of these schools is larger proportionally than in most of the larger cities. This system of schools was organized in 1800 and was presided over by a board of trustees of which Thomas Jefferson was the first president. Among the institutions of higher learning are the Carnegie Institution, the American University (Methodist), the Columbia University, the Georgetown University, the Catholic University of America, and Howard University. Many institutions afford splendid facilities for educational work in special departments, such as the Smithsonian Institution, the Library of Congress, the Bureau of Labor, the Bureau of Education, the Bureau of Fisheries, the Army Medical The city has many educational Museum, etc. and scientific associations. Numerous hospitals, homes, asylums, and relief societies are main-

INDUSTRIES. Though the city includes among its inhabitants many employees of the government, it is the permanent home of a large majority of its people. This gives rise to many industrial enterprises of vast extent, especially in the line of manufacturing. Within the city are 2,775 establishments that engage in manufacturing, and the value of the output is \$50,500,000 per year. About one-fifth of the total product is obtained from the establishments managed by the government. Cotton and woolen goods, jewelry, scientific instruments, wearing apparel,



NORTH FRONT OF THE WHITE HOUSE.



EAST FRONT OF THE NATIONAL CAPITOL.

(Art. Washington, D. C.)

· ·				
	0			
			10.	
		- 1		
		0	~	

3093

ironware, machinery, and musical instruments are among the leading products. Many extensive publishing houses have their seat in the city. Washington is important as a market for fruits, food products, and merchandise. It is the center of a large wholesaling and jobbing trade.

GOVERNMENT. The inhabitants of Washington have no direct vote in appointments to office within the city or in national affairs, but the government is directed by the Federal authorities. It is vested in a board of three commissioners, who serve for three years, two of whom are appointed by the President with the consent of the Senate and one is detailed by the Secretary of War. They have authority as empowered by Congress, and in them is vested the appointment of all clerks and subordinate officials. One-half of the expenditures are provided for by an appropriation of Congress and the remainder is raised by assessment upon the District. This plan of raising revenue is thought equitable for the reason that much of the property belongs to the United States, which is estimated, including the streets, to constitute about one-half of all the property. Extensive systems of waterworks, sanitary sewerage, and gas and electric lighting are maintained.

INHABITANTS. In 1900 the city had a population of 278,718, which included 86,702 colored inhabitants. The census of 1910 places the population of the District of Columbia at 331,069.

HISTORY. The site occupied by the city was selected by George Washington when the region was sparsely settled. The town was first called by its present name in 1791, when it had only 3,000 inhabitants. Pierre Charles L'Enfant, a French civil engineer, was employed to prepare the plan for the city proposed to be built. Washington selected the site and marked the boundaries, and the plans drawn up by the engineer were accepted by the commissioners in 1792. The British captured it in 1814, after a weak resistence at Bladensburg, and many of the public buildings were destroyed by fire. All the public buildings, including the residence of the President, were restored within the next few years. At the time of the Civil War it contained a population of 61,000 and was repeatedly threatened by Confederate armies, especially in 1864, when General Early advanced to within a few miles of the city. Georgetown was settled as early as 1695, occupying an elevated site on the Potomac. It remained an independent corporation from 1789 until 1878, when it was annexed to the city of Washington. Since that time the city has made rapid strides of advancement in population and industrial growth.

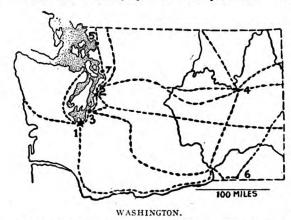
WASHINGTON, a western State of the United States, in the northwestern part of the country, popularly called the Corner State. It is bounded on the north by British Columbia, east by Idaho, south by Oregon, and west by the Pacific Ocean. The length from east to west is

350 miles and the extreme breadth is 225 miles. It has an area of 69,180 square miles, which includes 2,300 square miles of water surface.

DESCRIPTION. The Cascade Mountains divide the State into two sections, which differ widely in climatic and surface condition. The eastern section comprises about two-thirds of the State and is formed largely of grazing lands. This region is a treeless plain, with an elevation of 1,000 to 2,000 feet above the sea, and is characterized by more or less dry canons and hilly tracts along the larger streams. In the western part the surface is mountainous, but the rainfall is greater than in the eastern part, and the climatic conditions are more favorable to the growth of vegetation. Gray's Harbor is the chief inlet from the Pacific, while Puget Sound, a beautiful sheet of water, extends inland from the straits of Georgia and Juan de Fuca. Numerous fertile islands lie off the shore, both in the Pacific and in the straits toward the northwest, most of the latter being included in San Juan County. Within Washington the Cascade Mountains have a general elevation of 8,000 feet. In two places they are broken by passes, known as Stampede Pass and Steven's Pass, through the former of which passes the line of the Northern Pacific Railway and through the latter, that of the Great Northern Railway. Among the highest elevations are Mount Baker, 10,827 feet; Mount Adams, 12,470 feet; and Mount Rainier (Tacoma), 14,526 feet. A range of the Cascades, known as the Olympic Mountains, stretches from the Strait of Juan de Fuca toward the south, whose highest peak, Mount Olympus, has an elevation of 8,150 feet. This range stretches southward into Oregon and is cut from the southern end of the Puget Sound valley by the valley of the Chehalis River, which has its outlet in Gray's Harbor.

Washington lies almost entirely within the basin of the Columbia, which crosses the northern border from the Dominion, flows through the eastern part of the State, and forms most of the southern boundary. The Clark Fork crosses the border from Idaho, but joins the Columbia after passing through the northeastern corner into Columbia. A part of the western border is formed by the Snake, which flows through the southeastern corner and joins the Columbia at Ainsworth. The Spokane River enters the State from Idaho, passes the city of Spokane, and joins the Columbia at Fort Spokane. Other tributaries within the State include the Charles, the Okanogan, the Wenatachee, the Yakima, the Cowlitz, and the Lewis rivers. The northwestern part of the State is drained chiefly by Puget Sound, which receives the inflow from the Skagit, the Nesqually, the White, and the Puyallup rivers. Numerous lakes of considerable size are located within the State, most of them in the mountainous region. They include Lake Chelan, Washington (connected by canal with Puget Sound), Moses, Big Swamp, and Queniult. Throughout the mountains are forests of valuable timber, such as spruce, red and white cedar, red and yellow fir, oak, ash, alder, larch, and hemlock.

The climate in the eastern part is quite dry, owing to the fact that the greater part of the moisture is condensed by the Cascade Range before it reaches the plains. Here the mean temperature for January is 30° and for July 74°, but the extremes range from 30° below zero to 110° above. Western Washington has an equable climate, with a mean temperature of 40° in January and 62° in July. The extremes in this section range from 10° in winter to 95° in summer. The rainfall in the western part is excessive, being 132 inches on the Pacific coast, and about 50 inches at Olympia. In some places on



1, Olympia; 2, Seattle; 3, Tacoma; 4, Spokane; 5, Bellingham; 6, Walla Walla; 7, Everett. Dotted lines indicate principal railroads-

the coast the rainfall reaches 140 inches and the precipitation is confined chiefly to the winter months. Eastern Washington has a rainfall of from 14 to 16 inches. In the Great Plains of the Columbia River the rainfall sometimes is as low as 10 inches. The climate is singularly healthful.

MINING. Washington is rich in mineral deposits. Extensive coal fields are found in the east central part and the basin of Puget Sound, and it is the leading coal-producing State of the Pacific coast. The annual output of this mineral is reported at 3,575,000 short tons, and the larger part of the product is obtained from King, Pierce, and Kittitas counties. Gold and silver are mined in the mountains. Granite, limestone, sandstone, and clays are obtained in abundance for manufacturing and constructive purposes. Other minerals include copper, lead, iron, tellurium, arsenic, platinum, slate, and antimony. Mineral waters with curative properties are found in many sections of the mountains.

AGRICULTURE. About 25 per cent. of the total area is included in farms, which average 256 acres. A large variety of crops are grown, since

the soil has elements of fertility suitable for general farming. Irrigation is carried on extensively in the eastern part, but wheat can be grown successfully in many sections without artificial watering. The rainfall during winter is usually sufficient to supply moisture for the growing crop. Wheat exceeds in acreage all other cereals combined and the quality is of a high class. A large section of country between the Cascade and the Olympic mountains is well adapted to all classes of farming. Among the leading crops beside wheat are oats, barley, hay, potatoes, sugar beets, hops, rye, and fruits. Irrigation is carried on most extensively in the valleys of the Yakima and the Columbia.

The eastern part of the State, though located in the arid region, has large stretches of country that are well grassed, and rich grazing lands are

likewise found on eastern slopes of the Cascades. This has given rise to large livestock interests. Cattle are grown extensively for meat and dairying and choice breeds of horses are reared. There has been a constant increase in the number of sheep and the clip of wool. Other domestic animals include swine, mules, goats, and poultry.

Manufactures. The State has an abundance of raw material to promote manufacturing enterprises, especially timber, coal, stone, and agricultural products. The fisheries yield products annually which are valued at about \$6,800,000. Vast quantities of fish are canned and cured for the market, especially the salmon, blue back, halibut, cod, smelt, and oysters. Large interests are vested in flour and grist milling, slaughtering and meat packing, the manu-

facture of lumber and timber products, and the output of cheese and other products obtained from the dairy. The general manufactures include machinery, earthenware, clothing, canned and dried fruits, ships, furniture, hardware, cigars, beet sugar, and paper and wood pulp. Seattle, Tacoma, Spokane, and Bellingham are the chief manufacturing centers.

TRANSPORTATION. The Snake and Columbia rivers and Puget Sound furnish facilities for inland communication. Puget Sound is suitable for the largest seagoing vessels as far as Seattle and ships of medium size sail as far south as Tacoma. The entire coast line, including the inlets, has an extent of 2,000 miles. Three trunk lines traverse the State from west to east, the Great Northern, the Northern Pacific, and the Chicago, Milwaukee and Saint Paul railways. Other lines include the Canadian Pacific and several others. Electric railways are operated through some parts of the State, especially in the western section. A large trade with foreign countries is carried through ports on Puget Sound, Gray's Harbor, and Willapa Harbor, from which regular liners sail to European and

Asiatic countries. The chief exports include coal, lumber, canned fish, cereals, and live stock.

GOVERNMENT. The constitution was adopted when the State was admitted, in 1889. It vests the executive authority in the governor, lieutenant governor, secretary of State, treasurer, auditor, attorney-general, commissioner of public lands, and superintendent of public instruction, each elected for four years. Legislative authority is vested in the General Assembly, which consists of a senate and a house of representatives. Membership in the latter is limited between 63 and 99 members, while the senators cannot number less than one-third nor more than one-half of the number of representatives. Sessions of the General Assembly are held biennially. A supreme court of five judges, elected for six years, has the highest judicial authority. Superior courts are maintained in the counties. Local government is administered by towns, municipalities, and counties.

EDUCATION. The schools are supervised by a State superintendent of public instruction, who is elected for four years and is assisted by a board of education, which is appointed by the Governor with the consent of the senate. All the public schools are required to have not less than three months of school during the year, but the average time the schools are in session is 140 days, which is exceeded only by a few of the states. Based on the school population, the rate of illiteracy is 3.1 per cent. The rural schools are organized on the district plan, being supervised by a county superintendent, and the towns and cities maintain graded schools. A permanent school fund yields a part of the revenue for the support of public instruction, but the principal income is derived from State and local taxes. Normal schools for the instruction of teachers are situated at Cheney, Bellingham, and Ellensburg, but normal training is likewise given in several colleges and a number of public high schools.

The State University of Washington, situated at Seattle, is at the head of public instruction. Other institutions of higher learning include the Washington Agricultural College and School of Science, at Pullman; the Whitman College, at Walla Walla, and the Gonzaga College, at Spo-Chehalis is the seat of an industrial school, Walla Walla has the penitentiary, and Vancouver is the seat of a home for the feebleminded. The hospitals for the insane are located at Medical Lake and Fort Steilason. Orting is the scat of a soldiers' home. A State board of control has general charge of the char-

itable and penal institutions.

INHABITANTS. The inhabitants include 111,-364 persons of foreign birth, who consist chiefly of Canadians, Germans, and immigrants from Great Britain. Olympia, in the western part of the State, is the capital. Other cities include Seattle, Spokane, Tacoma, Bellingham, Walla Walla, and Everett. In 1900 the State had a population of 518,103. This included a total colored population of 21,799, of which 2,514 were Negroes, 3,629 Chinese, 5,617 Japanese, and 8,039 Indians. Population, 1910, 1,141,990.

HISTORY. The region now included in Washington was discovered by Juan de Fuca, a Greek sailor in the service of Spain, in 1592, and his name has been given to the strait south of Vancouver Island. Boston merchants sent an expedition to explore the Columbia and establish trade with the Indians, in 1789, and another expedition for the same purpose was organized by John Jacob Astor in 1810. Lewis and Clark visited the region in 1805 by crossing the Rocky Mountains and spent the winter on the Pacific coast. England claimed a part of the region, but in 1846 recognized the claims of the United States to all of the Oregon country. The first permanent settlement was made at Tumwater in 1845 and the Territory was organized in 1853. Rapid settlement of the region, stimulated by the extensive natural resources and the building of railroads, led to the admission of Washington as a State in 1889. Thousands of tourists from all parts of the continent visited the State in 1909, being attracted by the Alaska-Yukon Exposition, which was held on the ground of the University of Washington, in Seattle.

WASHINGTON, Booker Taliaferro, educator, born a slave at Hale Ford, Va., April 18, 1858; died Nov. 14, 1915. The presumption is that his father was a white man. His mother removed to Malden, W. Va., shortly after the emancipation, and he attended school in the winter months and worked during the summer in the salt and coal mines. In 1871 he went to Hampton, Va., where he became a student in the Hampton Institute for colored boys. Though greatly limited by poverty in his effort to secure an education, he made rapid advancement in his studies, and in 1875 graduated from the institution with the highest class honors. He attended Wayland Seminary, Washington, D. C., a short time, but soon after began to teach at Hampton, and in 1881 was placed in charge of the Tuskegee Institute (q. v.). The institution at that time consisted of a few very poor buildings, but was supported by an annual appropriation of \$2,000 from the State of Alabama. By heroic efforts and undaunted perseverance he converted that institute into the most famous center of learning and industrial life devoted to the education of Negroes in the world. He is in demand as a lecturer on economic and educational questions, being an entertaining, thoughtful, and scholarly speaker. Many of his writings have been published in current magazines. In 1900 he published "The Story of My Life," which contains a highly interesting account of his life. He wrote "Character Building," "Working with the Hands," "Up from Slavery," and "The Future of the American Negro."

WASHINGTON, George, first President of the United States, born in Westmoreland County, Virginia, Feb. 22, 1732; died at Mount



GEORGE WASHINGTON.

Vernon, Dec. 14, 1799. His grandfather, Lawrence Washington, came from England to Virginia in 1657 and settled at Bridge Creek, on the Potomac River, where his father, Augustine Washington, died in 1743. George was the eldest

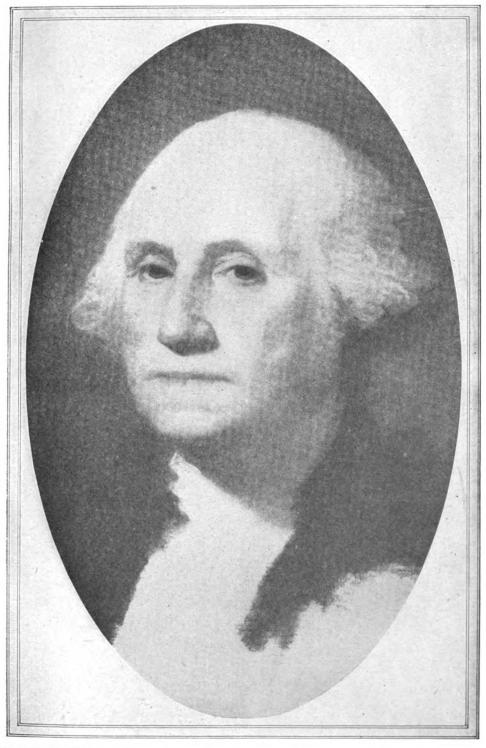
child by the second wife of the latter, Mary Ball, and the primitive condition of the country made it possible for him to acquire only a limited education in elementary subjects. He was of a studious disposition, which enabled him to attain a considerable knowledge of mathematics and surveying, and ultimately he adopted the profession of a surveyor. In 1751 he was appointed adjutant general of one of the districts of Virginia, with the rank of major. He was sent by Lieutenant-Governor Dinwiddie, of Virginia, in 1753, on important business to the French army in the Ohio valley. When the war broke out the following year, he was promoted to the rank of lieutenant colonel, and in 1755 acted as aidde-camp to General Braddock.

Washington had all the qualities needed to make a successful commander and at the Battle of Fort Duquesne, occupying the present site of Pittsburg, he showed remarkable mastery of military tactics. Though many of the officers in that battle were slain or wounded, Washington returned safely from the disastrous expedition, but in the contest had two horses shot under him. He left the army at the close of the war and on Jan. 17, 1759, married Martha Custis, a rich widow of Virginia, the former wife of John Parke Custis. Shortly after he removed to Mount Vernon, that estate having been given to him by his brother, Lawrence. For sixteen years he led the life of a planter, at Mount Vernon, and on his large estate kept many slaves, a total of 125, who were emancipated by his will at the death of his wife. In the meantime he served as a magistrate or as a member of the Legislature, and was a delegate to the First and Second Continental congresses. The Second Continental Congress appointed him commander in chief of the army, on June 17, 1775, and he hastened to Cambridge, Mass., where he took command of the army under the historic elm on July 3. His first military reform was to reorganize the raw and ill-equipped troops, and his early successes caused the British to evacuate Boston in the early part of 1776.

The first half of the year following the adoption of the Declaration of Independence was discouraging to the Americans, but Washington's brilliant surprise of Trenton and the victory at Princeton suddenly raised the courage of those who supported the Continentals. He continued as commander in chief of the armies throughout the war of independence, and, although disaffection, defeats, and lack of supplies disheartened others, he remained firm and persevering. When victory and peace finally crowned the efforts put forth by the Americans, in 1783, he retired to private life at Mount Vernon. Washington was a delegate to and president of the national convention which met in Philadelphia, Pa., in 1787, and adopted the Constitution. He was the unanimous choice for President and was inaugurated at New York, April 30, 1789, and at the end of his first term was unanimously reëlected. On March 4, 1797, he retired to private life, having declined a third election to the Presidency.

Washington selected Jefferson as Secretary of State: Knox, of War: Hamilton, of the Treasury; and Randolph, Attorney-General. In 1793 he issued a neutrality proclamation and made tours to the north and south, and in 1796 issued his famous Farewell Address to the people. When a war was threatened between France and the United States, in 1798, he was again appointed to the chief command of the army of the United States, with the rank of lieutenant general, but died soon after at Mount Vernon. Washington had no children, but adopted two grandchildren of his wife. He was a man of remarkable self-control and dignified appearance. being six feet two inches tall, and in public matters towered above party strife. He was a Freemason and served as master of his lodge. Congress adopted resolutions at the time of his death, their passage being moved by John Marshall, and in them occur the following words: "First in war, first in peace, and first in the hearts of his countrymen." His home at Mount Vernon, about sixteen miles below Washington, became property of the Federal government in 1858. Many monuments have been reared to commemorate the notable events of his life.

Washington rightfully has a preëminent position among the warriors and statesmen of America. He possessed in a large measure the faculty of selecting strong men as advisers and coworkers, such as General Greene, Marquis de Lafayette, Baron von Steuben, Thomas Jefferson, and Alexander Hamilton. Among the notable events which transpired within his time are the French and Indian wars, the American Revolution, and the establishment of the United States of America. His administration as President witnessed the admission of Kentucky, Vermont, and Tennessee; the Federal assumption of



(Art. Washington)
GILBERT STUART'S PORTRAIT OF GEORGE WASHINGTON.

		Œ.	
	-	+ +	

the debts contracted by the several states during the Revolution; the Indian wars in the Northwest Territory; the establishment of the first

3097

Bank of the United States; the founding of the City of Washington; the Whisky Insurrection; the establishment of the national mint in Philadelphia; and the conclusion of important treaties with European countries, notably England and

France

WASHINGTON, Martha, wife of George Washington, born in New Kent County, Virginia, May, 1732; died at Mount Vernon, May 22, 1802. She was a daughter of John Dandridge, a planter of Virginia, who held the rank of colonel. In 1749 she married John Parke Custis, a wealthy planter, and soon after removed to the region of the Pamunkey River. Two of their four children died in infancy and Custis died in 1757, leaving his widow a valuable estate. She met George Washington about a year after and in 1758 made a marriage engagement with him, but the ceremony was not performed until in 1759, owing to the circumstance that Colonel Washington was absent on his campaign in the north. The life of Mrs. Washington at Mount Vernon was quite similar in style to that of the English aristocracy. She took pleasure in entertaining, was a good housekeeper, and was in close sympathy with the military and political measures of her husband. However, the latter was not privileged to enjoy his home during the long war for independence, visiting Mount Vernon only twice within the period of the Revolution, but she accompanied him to New York and Philadelphia, and rendered personal assistance during the long winter at Valley Forge. It is said of her that she "was busy from morning till night providing comforts for the sick soldiers."

She was simple in attire, dressed in garments that were spun and woven at Mount Vernon, and wore her hair grouped under a plain cap. Her general dislike for official life caused her to remain at her home much of the time, and she was much pleased when her husband refused the office of President after serving two terms. The remainder of her life was spent at Mount Vernon, where she took delight in discharging domestic duties and in entertaining the large number of visitors who came as guests of her husband. She had many letters from Washington, both before and after their marriage, but these she destroyed before her death, preferring that the confidence shared by them should not be made public. Her death occurred about two and a half years after that of her hus-

WASHINGTON, Treaty of, a treaty concluded at Washington, D. C., in 1871, between Great Britain and the United Staes. It had for its object the settlement of various differences between the two governments, the chief of which was the dispute in regard to the Alabama Claims.

The commission consisted of five representatives of the United States, headed by Hamilton Fish and E. R. Hoar, and five representatives of Great Britain, headed by Earl de Gray and Sir John MacDonald. The first session convened on May 8 and 34 meetings were held, after which the treaty was proclaimed in force on July 4. Geneva, Switzerland, was selected as the place of meeting. Besides adjusting the Alabama Claims, the commissioners declared certain rules regarding neutrality in war, settled claims of British subjects against the United States, adjusted some differences in regard to fisheries, and submitted for arbitration to the Emperor of Germany the northwestern boundary dispute. 'See Geneva Award.

WASHINGTON, University of, a State institution of higher learning founded at Seattle, Wash., in 1861. In the early history of the institution it ranked only as an academy and the first class did not graduate until in 1876. The departments include the College of Liberal Arts, the Graduate School, the College of Engineering, and the schools of Mines, Pharmacy, and Law. It has grounds which cover 355 acres and the value of the property is about \$2,150,000. The faculty includes 210 teachers and professors and the library contains 85,000 volumes. About 4,750 students attend annually.

WASHINGTON AND LEE UNIVER-SITY, an educational institution at Lexington, Va. It had its beginning in 1749, when Robert Alexander established the Augusta Academy, which was removed to Lexington in 1792. The name was changed to Washington University in 1798, when General Washington made a donation of some funds, and its present name was adopted in honor of Gen. Robert E. Lee, who became its president after the Civil War. The institution has courses in classics, sciences, law, literature, and engineering. It has about 45 instructors, 475 students, and a library of 55,000 volumes. The endowments amount to \$875,000 and the property is valued at \$500,000. It is the burial place of Robert E. Lee and his resting place is marked by a statue.

WASHINGTON ARCH, a memorial erected in New York City to commemorate the first inauguration of George Washington as President of the United States. It was designed by Stanford White, an architect of New York, and is located at the foot of Fifth Avenue. The structure is 62 feet wide and 77 feet high, and the archway is 30 feet wide and 47 feet high. It is constructed of marble. A popular subscription was raised to defray the expense, which

was \$128,000.

WASHINGTON COURT HOUSE, a city of Ohio, county seat of Fayette County, 75 miles northeast of Cincinnati. It is situated on Paint Creek and on the Baltimore and Ohio, the Ohio Southern, and other railways. Among the noteworthy buildings are the high school, the public

library, several fine churches, and the county buildings. It has manufactures of flour, boots and shoes, woolen goods, and machinery. Electric lighting, sewerage, and waterworks are among the municipal facilities. The surrounding country is agricultural and stock raising. Population, 1900, 5,751; in 1910, 7,277.

WASHINGTON ELM, the name given to an elm in Cambridge, Mass., situated near the northwestern corner of the Common. It is celebrated because Washington stood under this tree at the time he assumed command of the American army, on July 3, 1775. Although it is protected against injury, the tree is decaying

quite rapidly.

WASHINGTON MONUMENT, a celebrated obelisk in Washington, D. C., erected to the memory of George Washington. A popular movement for a national memorial began before the death of Washington and he expressed his own preference for the site, which is on a mound at the west end of the Mall and due south of the Executive Grounds. monument is 555 feet high, with an elevator and an iron stairway of 900 steps within, which affords access to the base of the apex. The shaft is 55 feet square at the base, where the lower walls are 15 feet thick, but at an elevation of 500 feet, where the pyramidal top begins, the walls are 18 inches thick and about 35 feet square. The construction of the outer walls is of white marble blocks, which were cut in the most careful manner, and the inside walls are of blue granite, but the two parts of masonry are closely connected. A plumb line suspended from the top of the monument inside shows that the deflection from the perpendicular is less than three-eighths of an inch. Many of the large stones of the inside walls are marked, indicating that they were contributed by particular states or societies. Construction work began in 1848, when the corner stone was laid, and the monument was dedicated on Feb. 22, 1895, the anniversary of Washington's birthday. The entire cost was \$1,187,710. No ornamentation or inscription marks the obelisk, which is looked upon as a monument to the American people in the name of their foremost representative.

WASHINGTON UNIVERSITY, a coeducational institution of higher learning at Saint Louis, Mo., chartered as Eliot Seminary in 1853. It was so named in honor of Rev. Eliot of that city, but in deference to his wishes the name was changed in 1854 to Washington Institute. Three years later, by an amendment to the charter, the institution became Washington University. The charter was to be perpetual and was of the most liberal character, the only limitations being those forbidding any sectarian or partisan instruction. An evening school for boys was opened in 1854 and soon a day school was begun, the forerunner of the present Smith Academy, a preparatory school of the university. The

college was organized in 1858 and the first degrees were granted in 1862. A building for the college was erected in 1858, to which a wing was added and which now forms the home for the School of Engineering and Architecture. The Saint Louis Medical College was made a department of the university in 1891, to which was united, in 1899, the Missouri Medical School, thus forming by the union the present medical department. Mary Institute, a school for girls, was organized in 1858 and the Manual Training School was established in 1879.

In 1894 a tract of land was purchased northwest of Forest Park. This tract now includes 115 acres. Upon this commanding site twelve fireproof, handsome buildings have been erected. The endowment funds have been so largely increased as to afford excellent opportunities for the pursuit of all branches of study. Degrees issued by the institution are held in high esteem, and their holders are admitted without examination to graduate schools of the highest standings. The general and professional libraries are ample and the technical laboratories are supplied with the best modern apparatus. It has ample dormitory facilities and affords splended opportunities for physical training under competent direction. The institution recently entered upon the beginning of a second half-century of work with full confidence in its future. It has 190 instructors and an average enrollment of about 2.200 students.

WASHITA (wosh'i-ta), or Ouachita, a river of the United States, which rises near the western boundary of Arkansas and has a general course toward the southeast. It has a length of 550 miles, two-thirds of which are navigable, and it joins the Red River at the southeast corner of Catahoula County, La. The chief tributaries are the Little Missouri, Saline, and Tensas rivers.

WASP (wosp), a genus of insects which somewhat resemble bees. They differ from bees mainly in that they have a more powerful

sting, the body is less bulky, and in that they are not useful for the production of wax and honey. They are divided into two general classes, the social wasps and the solitary wasps. The solitary wasps build



NESTS OF WASPS.

small nests in the ground, or construct them of pasty material on trees or walls, and divide them

into two or three cells. These cells are partly filled with food, usually with caterpillars and other insects paralyzed by being stung, and afterward the food is consumed by the larvae. Social wasps live in communities and include males, females, and neuters or workers. The neuters and females have a venomous sting, quite similar to the sting of a hornet. Most species construct a papery nest of masticated vegetable materials, which they suspend from the branches of trees. These nests are walled peculiarly to prevent the entrance of moisture and within is a large chamber, which is reached by a tortuous gallery

In cold climates most of the adult wasps die in the winter, only a few females surviving, but a new brood is soon produced from eggs laid in the spring. Each of the surviving females finds a separate location in which to lay the eggs, thus giving rise to several distinct communities, all of them constructing new nests, instead of utilizing the old ones. Some families have 150 to 300 wasps, but in tropical countries the nests are frequently from five to six feet long and contain 15,000 to 25,000 wasps. They feed on the sweets of flowers and fruits and on insects, killing the latter with their jaws. Many species have been described, ranging from the smaller forms common to colder regions to the large tropical species. Several species of wasps native to Brazil resemble the bees in that they store honey. Insects of this genus are quite like bees in that they are infested by a class of hymenopterous parasites, which deposit their eggs in the bodies, the young living in the region of the back.

WATAUGA ASSOCIATION (wä-ta'gà), an organization associated with the history of the United States, organized in 1769 to settle the territory now comprised in the State of Tennessee. It organized a scheme of government for the settlement, which consisted of a legislative council of thirteen members, who were elected by the signers of the articles upon which the government was based. Five of the councilors had general executive authority and they chose one of their own members as supreme chairman. Many outlaws and adventurers took up their residence in the settlement, but they were not subject to the government of the association, hence the scheme did not prove satisfactory. The region became known as Washington District and in 1876 the representatives were given seats in the assembly of

North Carolina.

WATCH, an instrument for keeping and indicating time, usually inclosed in a rounded case so it may be carried in the pocket. The first watch was made at Nuremberg, Germany, in 1477, but the early watches had but one hand and required winding twice a day. There is a considerable similarity between a watch and a clock, each having a train of wheels, which is moved and controlled by some form of mech-

anism. In the watch the mainspring, whose elastic force produces the motion of the whole machinery, takes the place of the weight in the clock. The mainspring, a spiral made of steel, is wound in a cylindrical barrel, and in unwinding moves the barrel in such a manner that motion is carried from one wheel to another by means of cogs and pinions. When wound up by turning the watch key, the mainspring acts upon the wheels exactly as does the weight of a clock, and, to prevent the watch from running down and to make the wheels move with uniform motion, the balance wheel and hairspring have been introduced, which take the place of the pendulum of a clock. The balance wheel and the hairspring act upon the escapement (a. v.), a variously designed mechanism that serves to gauge the movement, just as the scapewheel of the clock is acted on by the pendulum. The time-keeping qualities of a watch depend largely upon the perfection of the escapement.

Many widely different sizes and kinds of watches are in use. They are variously constructed with either the lever, the horizontal, or the chronometer escapement. Watches having the chronometer escapement are of the highest attainable precision, being rendered independent of variation in temperature by a compensation balance wheel and an especially delicate and effective escapement. Those used to determine the longitude of a ship at sea are set in gimbals, whereby they remain level. They usually beat half-seconds. Watches of the cheaper class are now made principally by machinery, the different parts being made so as to be interchangeable, thus enabling the watch repairer to replace with an exact duplicate any part that becomes unfit for service. Many improvements were made in the last century, such as the addition of hands to indicate minutes and seconds and the mechanism for winding the watch and setting it by turning the stem instead of a key. Watches were made mostly in France, Germany, and Switzerland up to within the last fifty years, but now extensive establishments are maintained in many cities of Canada and the United States. The largest watch manufacturing establishments in the United States are at Boston and Waltham, Mass., and Elgin, Ill.

WATER (wa'ter), a substance formed by the combination of oxygen and hydrogen, in the proportion, by volume, of one part oxygen to two parts hydrogen; or, by weight, of eight parts oxygen to one part hydrogen. It was classed as an element until 1773, when Lavoisier, a French chemist, discovered that it is a compound substance. Like the gases of which it is formed, pure water has neither taste nor smell. Although colorless in small quantities, it has a deep-blue color when in large masses. It is slightly compressible and a powerful refractor of light, but is not a good conductor of heat and electricity. At a temperature of 32° Fahr., it freezes and

forms ice, or snow, and boils at 212° under a pressure of 29.9 inches of mercury. Water is widely diffused in nature, covering three-fourths of the surface of the earth and constituting a large per cent. of all animal and vegetable life. It is widely distributed in the air as vapor and comprises a large part of many mineral substances. Water constitutes about seven-eighths of the human body. Though widely diffused in nature, we meet with it only in the impure form and are able to obtain it in a pure state only by distillation, that is, by boiling it in a retort and condensing the steam.

Rain water is the purest kind obtainable, since it results from vapor taken up from the surface of the earth, but even that is rendered slightly impure by smoke, dust, and various gases contained in the air. The atmospheric waters, whether in the form of rain, hail, or snow, are quite free from foreign substances, but when they sink through the porous strata of the earth and reappear as spring or river waters they are always charged, more or less, with various salts taken up from the earth. These substances embrace gypsum, iron, salt, lime, sulphur, and many others. When the proportion of minerals is small, the water is said to be soft and, when the proportion is large, it is called hard water. Mineral waters are those containing sufficient mineral substances to make them of value for medical or commercial purposes, such as are derived from siliceous, calcareous, sulphurous, or salt springs.

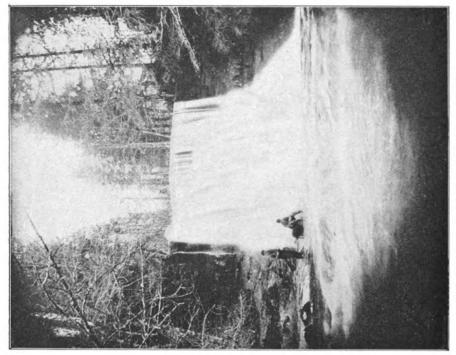
The weight of a given quantity of water depends upon its temperature. This is due to the circumstance that water contracts and becomes denser in cooling, though it is not the heaviest when reduced to the coldest point. It is at its maximum density when the temperature is 7.2° warmer than the freezing point, or at 39.2° Fahr. When warmed to a higher degree of temperature it becomes lighter, until at 212° it passes off in steam; and, when reduced to a lower temperature, it becomes lighter until it freezes at 32°, thus accounting for the circumstance that ice will float on the surface of water.

It may be said that the ocean is the great reservoir for the supply of water. Evaporation conveys a constant supply from the surface of the sea into the atmosphere, where it is carried by the winds to different parts until it finally falls to the surface in the form of dew, frost, snow, or rain. Thus all plant and animal life is quickened, springs are formed, rills meander into the valleys and form streams, lakes and rivers are replenished, and finally the water again finds its way back to the ocean. Though the water of the ocean is salty, the saline matters are not taken up as the vapor rises. For this reason the growing plants are watered by nature pouring upon them the practically pure form. Besides watering the plants rains tend to purify the air and the surface of the earth by washing foreign substances along with them. Water exercises a continuous influence upon the surface of the land in that it softens the ground and carries many substances with it as it flows down the hills and valleys in the form of streams or glaciers. We see evidences of this in the channels of streams being cut deeper in some regions, while in others vast deposits of earth are made in the forms of river deltas and banks. Since water is absolutely necessary to life, it is quite important that it should be sought in its purest form. A cubic foot of fresh water weighs 62.32 pounds and is equal to 7.48 gallons. One gallon weighs 8.33 pounds. See Hygiene; Ice; Steam; Waterworks.

WATER BUG, the general name of any insect which lives almost entirely in water and feeds on other aquatic insects. Nearly all of these insects are active and effect movement in the water by means of oarlike hind legs. The color is brownish, the first pair of wings is horny, and the antennae are small. The head is small and the fore limbs are prehensile. They include the water-boatman, the back-swimmers, the marsh-treaders, the water-striders, and the creeping water bugs. These names indicate somewhat their habits of moving from place to place. Several allied species of insects are known as water scorpions. They are quite large, some species being two to three inches long, and are frequently seen flying about at night in search of food. In habits they are voracious and carnivorous. Two long filaments extend from the caudal extremity, through which respiration is effected.

WATERBURY (wat'er-ber-i), a city of Connecticut, in New Haven County, on the Naugatuck River, 32 miles southwest of Hartford. It is on the New York, New Haven and Hartford Railroad and is surrounded by a fertile farming and dairying country, which produces cereals, fruits, and grasses. The noteworthy cereals, fruits, and grasses. buildings include the Bronson Public Library, the Masonic Temple, the Waterbury Hospital, the Gerard School, the Convent of Notre Dame, and the Saint Margaret's Diocesan School. It has a fine soldiers' monument and a commodious city hall. The streets are lighted with gas and electricity. They are improved substantially by pavements, public parks, and an extensive street railway system. Among the chief manufactures are the Waterbury watches, a class of timekeepers used very extensively. Other products include buttons, edged instruments, silver-plated ware, carriages, boots and shoes, brass and metal goods, ironware, wearing apparel, and machinery. The region was settled in 1667, and the city was incorporated in 1853. Population, 1900, 45,859; in 1910, 73,141.

WATER COLORS, the general name of pigments used in painting, which are mixed with water and some adhesive, as size or gum, instead of oil. Colors of this class are prepared in various ways to suit the method of application. Those employed in coloring walls and

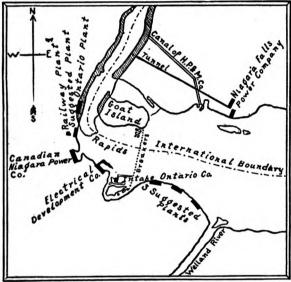


(Art. Waterfall) MINNEHAHA FALLS, ON MINNEHAHA CREEK, AT MINNEAPOLIS, MINN.

RANAKA FALLS, ON KANAKA CREEK, NEAR MAPLE RIDGE, B. C.

similar surfaces are mixed with size or glue, while those used in painting pictures are made in the form of small cakes. In painting with water colors the artist has a number of small brushes and several cakes of different colors, and secures advantage from the fact that the product is not only clearer, but dries more rapidly than painting in oil. Among the colors used chiefly are indigo, gamboge, cobalt blue, lake, carmine, vermilion, burnt ocher, pink reds, and ultramarine. They are usually mixed with water alone, but gum and other substances are sometimes added to the water, in order to give depth to the shadows and brilliancy to the lights.

WATERFALL, or Cataract, a descent of the water of a river or stream over a precipice or



Map to show Niagara Falls and the Niagara River, indicating their use for water power.

down a steep incline. Waterfalls occur most frequently in mountainous countries, where the streams from the mountain sides enter the valleys. They are due to the occurrence of breaks in the channels of streams, the water falling from the upper to the lower level. Rocky channels and sides are necessary to form an enduring waterfall, otherwise the break in the channel is soon worn down to a common slope. In most cases the volume of water is comparatively insignificant, but in some instances the fall is very great and the phenomenon is correspondingly grand. Yosemite Falls of California are the highest in the world, falling 2,660 feet by three plunges.

The Oroco Falls, in Monte Rosa, have a descent of 2,400 feet. Next to these are the Roraima Falls, Guiana, which bound 2,000 feet in two plunges. Niagara Falls, height 167 feet, the largest in the Western Hemisphere, are in the Niagara River, the outlet of the Great Lakes.

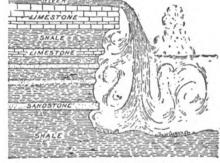
These falls are of much importance for the power obtained for manufacturing and other industrial purposes. Other noted falls include the Grand Falls, Labrador, 2,000 feet; Sutherland Falls, New Zealand, 1,900 feet; Staubbach Falls, Switzerland, 925 feet; Victoria Falls, Zambezi, 400 feet; and Hay River Falls, Alaska, 22 feet.

Waterfalls constantly recede, the rate depending upon the hardness of the rock. The causes of this action may be seen in the illustration, which gives a view of the different strata of earth which usually compose the ledges over which the water descends. It will be observed that the direct action of the water is greatly aided in the erosion by reaction after the main current strikes the bottom. It is estimated that

Niagara Falls recedes up the stream one foot per year. Some of the waterfalls present splendid scenery and are regarded among the most pleasing natural phenomena. This is true of the Yosemite Falls, which rivals the most beautiful scenic region in the world. The most noted cascade of the Mississippi valley is formed by the Falls of Minnehaha, near Minneapolis, Minn. It was made famous by the writings of Longfellow.

WATER GLASS, or Soluble Glass, the name given to any one of several alkaline silicates which contain a sufficient proportion of alkalies to render them soluble in water. Some substances of this class, such as Fuchs's soluble glass, are ordinarily insoluble in water, but they may be dissolved by placing it in boiling water. They are sirupy, transparent, and colorless and have a specific gravity of not less than 1.25. They are used for coating to preserve frescoes, the process being known as stereochromy, and their value consists in rendering the surface fireproof and waterproof. Other uses

consist in the manufacture of certain soaps, earthenware, and artificial stone. In a modified



EROSION OF WATERFALLS.

form they are employed in the dyeing and printing of fabrics.

WATERHOUSE (wa'ter-hous), Alfred, ar-

chitect, born in Liverpool, England, July 19, 1830; died in 1905. He studied in Manchester and by traveling in Italy. Later he prepared designs for the Manchester Assize Courts, which were selected after a competitive test. He made drawings for the city hall and Owen's College, in Manchester, and soon after prepared designs for the Royal Infirmary at Liverpool. works in London include the National Liberal Club, the City and Guilds' Institute, and the Saint Paul's Schools. In 1885 he was made a member of the Royal Academy. He received many medals and other awards from various associations. The Gothic style is a prominent feature of his designs.

WATER LILY, the common name of various plants resembling the true lily. They differ from the latter in that they are endogenous, that is, growing from within. On the other hand, true lilies are exogenous, that is, growing by external additions. About twenty species of water lilies are widely distributed in the lakes and rivers of the Temperate and Torrid zones. The fleshy rootstocks send rootlets down into the mud and long, cylindrical leafstalks grow upward, with circular or cordate leaves usually floating on the surface of the water. Beautiful solitary flowers, principally white, blue, or red, are borne on long cylindrical stalks and rise just above or float on the water. The Victoria Regia, native to the Amazon valley, is the largest water lily, its leaves ranging from five to twelve feet in width. The sweet-scented water lily is the best known plant of this class in North America. The blue lotus and the white lotus are water lilies native to the Nile. They bear pleasantly scented flowers and are cultivated extensively in hothouses. In most species the flower is of two days' duration. Some have leaves ranging in diameter from six to twelve feet, but they are somewhat smaller when cultivated in gardens.

WATERLOO (wa-ter-loo'), a city in Iowa, county seat of Black Hawk County, on the Cedar River, 104 miles northeast of Des Moines. Communication is furnished by a network of electric railways and by the Illinois Central, the Great Western, and the Chicago, Rock Island and Pacific railroads. It has a large trade in grain, live stock, and merchandise. The noteworthy buildings include the county courthouse, the Federal post office, the city hall, the public library, two high schools, the Masonic Hall, the Presbyterian Hospital, the Ellis Hotel, and the Academy of Our Lady of Victory. Water power is obtained from the river, which is crossed by several bridges. The manufactures include flour, earthenware, clothing, cigars, brooms, and machinery. The streets are wide and regularly platted, crossing each other at right angles, and are substantially improved by pavements, electric lights, waterworks, and a fine system of electric railways, which connects the city with Cedar Falls. The region was first settled in 1846. Waterloo was incorporated as a city in 1868. Population, 1905, 18,071; in 1910, 26,693.

WATERLOO, a town of Belgium, in the province of Brabant, about ten miles south of Brussels. It is famous as the scene of the battle of June 18, 1815, in which the French army under Napoleon was defeated by the allied forces under Blücher and Wellington. British army was commanded by Wellington and consisted of about 70,000 men, of whom 25,000 were British troops and the remainder were Germans and Belgians. This army had been defeated by Ney at Quatre-Bras on June 16 and had concentrated at Waterloo, while the German forces under Blücher had been defeated by Napoleon at Ligny. Napoleon had an army of 70,-000 trained veterans, with which he intended to defeat the British before the German army could reach Waterloo, while Wellington aimed to hold his position until Blücher could arrive with his army, when it was designed to make an assault upon the French.

With the situation understood in this manner by Napoleon, the French began the battle about noon and continued the attack with great vigor until evening. They were on the point of winning the contest when Blücher came to the rescue with the German army and turned the tide of battle by hemming the French in between the allied armies. As a last resort, the Old Guard, constituted of the veterans from the Imperial Guard, charged upon the allied forces with remarkable persistence, but they were either cut to pieces or compelled to retreat, and Blücher was soon in vigorous pursuit of the retreating French. Estimates place the French losses at 42,000 and those of the allied armies at 23,000. This celebrated engagement accomplished the final downfall of Napoleon, and from it the expression, "To meet one's Waterloo," has become proverbial.

WATERMELON. See Melon.

WATER METER, a mechanism for measuring and recording the quantity of water or other liquid flowing through a pipe. Many devices of this kind have been patented, differing somewhat in general construction, but the principal parts are quite similar in all of them. The water meter in general use contains a chamber of spherical form, so constructed that water may flow freely through it by means of the entrance and delivery pipes. Within the chamber is a tightly fitting disk, mounted on a ball and socket bearing, which revolves under a slight pressure of water, and the flow of the liquid is measured with every turn of the disk. A recording device, consisting of wheelwork, is connected with the disk, hence the number of revolutions made is shown by the dials. Some meters register the pressure and thus afford data for a calculation of the flow of water, but these are not in extensive use. Water meters are employed in most systems of waterworks, each consumer having one of these mechanisms attached

to the pipe that furnishes the inflow, and in this way it is possible to determine the quantity used and for which he is to pay.

WATER POLO, a game of ball played by The game somewhat resembles hockey, but the large, round ball is filled with air and floats upon the surface. It is played quite generally during the winter season, especially at colleges and other institutions which have ample swimming tanks. An even number of players take part in the game. The purpose of each side is to advance the ball by throwing or pushing it to the goal line of the opposing side.

WATERPROOFING, the art of rendering certain articles, such as paper and cloth, proof against penetration by water. A common method is to apply a coating of caoutchouc, but this has been found disadvantageous for some purposes, since articles coated in this way do not allow the passage of air. Woolen goods may be rendered impervious to water and at the same time permit the passage of air by dipping the cloth into a solution of soap, being careful to rub it thoroughly into the texture, after which it is dipped into a solution of alum. This causes a decomposition of the soap and alum, and the minute openings between the fibers are filled to the extent that water is excluded. Another plan is to dip the cloth into a solution of gelatine and isinglass, and afterward submerge it in a preparation of galls. This results in a kind of tanning process, the gelatine which has pervaded the cloth being rendered as insoluble as leather by the union with the tannin of the galls.

Mackintoshes and other similar wearing apparel are made by treating the fabrics with a solution of rubber. The goods are first coated on one side with a thin solution of rubber, after which the cloth is doubled, the coated sides being placed to face each other, after which pressure is applied. When finished for market, this product has the rubber coating on the inside. A good quality of this product is impervious both

to air and to water. See Oilcloth. WATERSPOUT (wa'ter-spout), a phenomenon which is quite common to certain regions of the sea and is due to the action of whirlwinds or tornadoes. It usually consists of a whirling column of water, extending from the surface of a lake or the ocean to the cloud above. Waterspouts originate from the rapid condensation of vapor that takes place, owing to the different temperatures of opposite winds and to the rarefaction produced in the currents of revolving air. In many cases portions of the clouds descend and whirl in the form of a funnel-shaped mass. The whirl may draw a column of spray from the surface of the sea, which it unites with the mass above, and may move as an immense pillar over the surface. In fairly calm weather the waterspouts have a vertical position, while winds bring them into a position oblique to the horizon. Waterspouts, whirlwinds, dust clouds, and tornadoes are essentially the same, differing from each other mainly in the quantity of moisture, their dimensions, their intensity, or the degree in which visible vapor has been formed. See Wind.

WATERTOWN, a city of Massachusetts, in Middlesex County, on the Charles River, seven miles west of Boston. It is on the Boston and Maine Railroad and has communication by electric railways. The features include the public library, the Mount Auburn Cemetery, and the United States arsenal. It is the residence of many Boston business men. Among the manufactures are paper, starch, soap, hardware, needles, wire, and machinery. It was settled in 1630 and was the seat of important meetings at the beginning of the Revolution, including the second and third provincial congresses. Population, 1905, 11,202; in 1910, 12,875.

WATERTOWN, a city of New York, in Jefferson County, of which it is the capital. It is on the Black River, 90 miles north of Syracuse, and is on the New York Central Railroad. Among the noteworthy buildings are the county courthouse, the post office, the State armory, the Y. M. C. A. building, the Henry Keep Home for the Aged, and the Flower Memorial Library. Water power is supplied for manufacturing purposes by the Black River. The manufactures include silk and woolen textiles, flour, paper, scientific instruments, carriages, steam engines, canned fruits, and farming machinery. Among the general improvements are pavements, waterworks, electric street railways, and several parks. The place was settled in 1800 and became the county seat in 1805. It was incorporated as a city in 1869. Population, 1905, 25,447; in 1910, 26,730.

WATERTOWN, a city of South Dakota, county seat of Codington County, 98 miles north of Sioux Falls. It is on the Big Sioux River and on the Great Northern, the Chicago and Northwestern, the Chicago, Rock Island and Pacific, and the Minneapolis and Saint Louis railroads. The surrounding country is fertile. Three miles northwest of the city is Lake Kampeska, which is reached by a railway. Among the chief buildings are those of the county, a fine high school, and a number of churches. The industries include flouring mills, grain elevators, machine shops, stock yards, and manufactures of implements and machinery. It has a large trade in wheat, live stock, and merchandise. Population, 1900, 3,352; in 1910, 7,010.

WATERTOWN, a city in Wisconsin, at the boundary between Dodge and Jefferson counties, on the Rock River, 35 miles northeast of Madison. Transportation facilities are furnished by the Chicago and Northwestern and the Chicago, Milwaukee and Saint Paul railroads. It is surrounded by a fertile farming and dairying country. The streets are paved substantially. They are improved by pavements, waterworks, and street railways. Among the manufactures are cheese, flour, cigars, shoes, lumber products, machinery, and farming implements. Watertown has many fine public schools and churches. It is the seat of Northwestern University, a Lutheran institution founded in 1865, and of the Sacred Heart College, opened in 1872. Other features include the public library, the city hall, and many large business blocks. It has a large retail and jobbing trade in merchandise. Population, 1905, 8,622; in 1910, 8,829,

WATERVILLE, a city of Maine, in Kennebec County, on the Kennebec River, 18 miles northeast of Augusta. It is on the Maine Central Railroad and on Ticonic Falls, which supply an abundance of water power. The principal buildings include the public library, the high school, the city hall, the Colburn Classical Institute, the Ursuline Academy, and the Colby College. Among the chief manufactures are leather, edged tools, machinery, furniture, clothing, and textiles. Pavements, waterworks, street railways, and sanitary sewerage are among the municipal facilites. The place was settled in 1760, but was a part of Winslow until 1802. It was chartered as a city in 1888. Population, 1900, 9,477; in 1910, 11,458.

WATERVLIET (wa-ter-vlet'), a city of New York, in Albany County, on the Hudson River, 150 miles north of New York City. It is on the Delaware and Hudson Railroad and the Erie and the Champlain canals. The features include the public library, the high school, the city hall, and the Saint Patrick's Academy. The United States arsenal is located here, occupying a tract of 109 acres along the river front. It has a large trade in merchandise and farm produce. Among the manufactures are saddlery, furniture, stoves, carriages, cotton and woolen goods, cigars, and machinery. Watervliet was incorporated with West Troy in 1836, but was made a city in 1897. Population, 1910, 15,074.

WATER WHEEL. See Wheel. WATERWORKS, a system of improvements and appliances to furnish a water supply. An ample quantity of pure water is of vast importance for the preservation of health in all cities. Wells drilled or dug in the ground are the common source of water supply in country People residing in villages, small districts. towns, and suburban districts utilize wells to a large extent. In many cases springs furnish ample quantities, while in some regions cisterns for storing rain water are the only source of supply. The greatest danger from impure water is in cities, where the soil may be polluted by impurities resulting from dense populations being crowded into a small space, thus tending to contaminate the water in wells. A system of waterworks is maintained in most towns and cities to overcome such dangers. Such a system involves both the collection of water at a common source and its distribution to consumers, usually by steam pumps, air compressors, tunnels, or aqueducts.

According to recent estimates, 3,575 systems of waterworks are maintained in the towns and cities of the United States, about three-fourths of which are under municipal ownership. On the other hand, practically all the systems of Canada are managed under the ownership of the municipalities. In nearly all instances the supply is both for domestic use and fire protection. Reservoirs or tanks located higher than the distributing pipes are utilized to distribute the water to consumers in the larger number of establishments, but in many large cities the pressure is obtained by pumping the water direct into the distributing pipes or mains. Large mains conduct the water on the principal streets and from them the smaller pipes carry a supply to offices, hydrants, and private residences. Loss in the water supply is prevented principally by charging each consumer for the water he uses and wastes, the measurements being effected by means of a water meter, an apparatus for recording the quantity of water passing through the supply pipe.

Some systems of waterworks are of vast extent, but it is possible to mention only a few of them. Indianapolis, Ind., derives its supply from artesian wells, which have a daily capacity of 25,000,000 gallons. The supply of water for Chicago is drawn from Lake Michigan by tunnels. Cribs are located several miles from the shore and from them the water is pumped by huge engines to central stations. Philadelphia derives its supply from the Schuylkill; Boston, from Cochituate Lake and Nashua River; and New York, from the Croton River by the reservoir system. Albany, N. Y., derives its supply from the Hudson River and has an immense water-purification plant, by which it is settled in reservoirs and filtered through beds of sand. In Saint Louis the supply is drawn from the Mississippi River. Milwaukee, Buffalo, and Cleveland are supplied from the lakes near those cities. Quebec derives its supply of water from Lake Saint Charles, seven miles distant, and that of Ottawa is obtained from an intake in the Chaudière River, about 3,000 feet above Chau-

WATSON (wŏt'sŭn), Henry Brereton Marriott, author, born at Caulfield, Australia, Dec. 20, 1863. He was taken to New Zealand at the age of nine years, attended Canterbury College in Christchurch, and in 1885 went to England to engage in journalism. His first literary work appeared in the form of contributions to The National Observer and for a time he was assistant editor of the Pall Mall Gazette. Most of his productions are novels that deal with exciting adventures and a few are historical romances. They include "The Web of the Spider," "The Princess Xenia," "Chloris of the Island," "The Heart of Miranda, and Other Stories," "The House Divided," and "Godfrey Merival, Being a Portion of His History."

dière Falls.

WATSON, James Craig, astronomer, born

in Fingal, Canada, Jan. 28, 1838; died in Madison, Wis., Nov. 23, 1880. He was born while his parents were visiting in Canada. In 1857 he graduated from the University of Michigan, at which he learned the art of grinding lenses. He became a professor of astronomy and director of the observatory of that institution, in 1863, and secured a like position at the University of Wisconsin in 1879. Watson discovered 23 asteroids, among them Io, Minerva, and Aurora, and in 1870 went to Sicily to witness an eclipse of the sun. He had charge of a company that observed the transit of Venus at Peking, China, in 1874, and was a judge of award at the Philadelphia Centennial Exposition in 1876. The government employed him in 1878 to observe a total solar eclipse in Wyoming. His writings include "Theoretical Astronomy," "Popular Treatise on Comets," and "Tables for Calculating Simple and Compound Interest and Discount." He was made knight commander of the Imperial Order of the Medjidiek by the Khedive of Egypt in 1875.

WATSON, John, author and clergyman, widely known by his pseudonym, Ian Maclaren, born in Manningtree, England, in 1850. He descended from Scotch parents, who settled at Perth, Scotland, in 1854. In 1870 he graduated from the University of Edinburgh and afterward studied theology at Tübingen, Germany. He first served as pastor of a Free Church congregation in Logiealmond, Scotland, a straggling village that furnished many of the striking features of his stories. He became pastor in Glasgow in 1877 and at Liverpool in 1880. His first writings appeared in the British Weekly and were afterward published in a volume called "Beside the Bonnie Brier Bush." Watson made several successful lecturing tours in Canada and the United States. His later writings include "The Days of Auld Lang Syne," "A Doctor of the Old School," "Kate Carnegie," and "The Mind of the Master."

WATSON, John Crittenden, naval officer, born at Frankfort, Ky., Aug. 24, 1842. He attended the United States Naval Academy, became a master in the navy in 1861, and saw service in the Civil War at Forts Jackson and Saint Philip. In 1862 he took part in the attack upon Vicksburg and the following year rendered efficient service in the Battle of Mobile Bay, where he was wounded. In 1898 he commanded the blockading squadron on the northern coast of Cuba, and the following year was made commander in chief of the naval forces at the Asiatic Station. He was made president of the naval retiring board in 1902 and served as special representative to the coronation of Edward VII.

WATSON, Thomas Edward, statesman and journalist, born in Columbia County, Georgia, Sept. 5, 1856. After attending the public schools, he studied at Mercer University, Macon, Ga., but a lack of means compelled him to leave that institution before graduating. Subsequently he studied law and was admitted to the bar. He was elected to the State Legislature as a Democrat in 1882 and in 1890 became a member of Congress. The People's party nominated him for Vice-President in 1896, when he received 27 electoral votes for that office, while Sewall received 149 and Hobart received 271. He established Tom Watson's Magazine in New York City, in 1905, but resigned as editor the following year. In two general elections, those of 1904 and 1908, he was the candidate for President on the Populist ticket, but did not receive any electoral votes. He published "History of France," "Life of Thomas Jefferson," and "Life of Napoleon."

WATT, James, famous inventor, born in Greenock, Scotland, Jan. 19, 1736; died Aug. 25, 1819. He was the son of a merchant and magistrate of Greenock, where he studied in the public schools. In 1755 he proceeded to London to learn the business of a philosophical instrument maker, where he likewise mended fiddles and other musical instruments. He became instrument maker to the University of Glasgow, in 1757, a position held by him until 1763, when he was appointed a civil engineer. In that line of work he surveyed for a commission that promoted a number of canals and harbor improvements. In the meantime he invented the micrometer, an instrument for measuring various small angles or dimensions, which is generally used in connection with a microscope or telescope. However, the invention that made the name of Watt famous is the modern condensing steam engine. It is said that he discovered the power of steam by observing its ef-

fect in passing from a teakettle. Though the steam engine had been employed before his time, it was an awkward and wasteful machine and could be used only in pumping at a slow rate.

The invention

JAMES WATT. of Watt adapt-

ed the steam engine to the purpose of driving machinery. Although this product has since been improved by a large number of inventors, the original machine employed the same principles which are now utilized. In 1774 he associated himself with Matthew Boulton, at Soho, near Birmingham, England, where large numbers of steam engines were manufactured. He retired from business in 1800 and conveyed his interests in manufacturing enterprises to his son, James Watt (1769-1848). The later years of his life were spent at his home near Birmingham, where he invented or improved a number of mechanical appliances, including a press for copying. Watt was honored by being made a member of the National Institute of France and a fellow of the Royal Society of London. The University of Glasgow conferred a degree upon him in 1806, and a fine monument was erected to his memory in 1824.

WATTERSON (wŏt'tēr-sŭn), Henry, journalist, born in Washington, D. C., Feb. 16, 1840. His father, Harvey McGee Watterson (1811-1891), was a journalist. He was educated by private tutors and at an early age became



HENRY WATTERSON.

editor of the Washington Democratic Review. In 1861 he removed to Nashville, Tenn., and edited the Republican Banner, but soon afterward enlisted for service in the Confederate army. He was on staff duty from 1861 to 1863 and subsequently did scout service in connection with the army of General Johnston. At the close of the war he

again edited the Republican Banner at Nashville, but subsequently founded the Courier-Journal at Louisville, Ky., which he made one of the most influential newspapers in America. He supported Horace Greeley for President in 1872 and Samuel J. Tilden in 1876. Though mentioned as a candidate for office, he persistently refused to enter the public service. However, he served in Congress from 1876 to 1877, but declined reëlection. In 1893 he delivered the dedicatory oration at the Columbian Exposition in Chicago. Watterson ranks as an able writer and speaker. He is the author of "Oddities of Southern Life and Character," "Life of Lincoln," and "History of the Spanish-American War."

WATTS, George Frederick, painter, born in London, England, Feb. 23, 1817; died July 1, 1904. He studied in the Royal Academy, where he made his first exhibit of paintings, in 1837. In 1843 he exhibited "Caractacus" at Westminister Hall and received a prize of \$1,500. His painting entitled "Alfred Inciting the Saxons to Prevent the Landing of the Danes" won a prize of \$2,500 in 1846. He was made a member of the Royal Academy in 1867. Among his best known paintings are "Daphne," "Orpheus and Eurydice," "Love and Death," "Fata Morgana," "Meeting of Jacob and Esau," and "Love Triumphant."

WATTS, Isaac, clergyman and hymn writer, born in Southampton, England, July 17, 1674; died Nov. 25, 1748. His mother taught him in the classics when only in his fifth year, and at

the age of eight he was able to write devotional pieces. In 1690 he enrolled as a student in an academy in London, and subsequently became pastor of the Independent congregation of Mark Lane, London. Overstudy at an early age had greatly impaired his health, hence he devoted his attention largely to literature and hymn writing instead of preaching. His works in prose include "The Use of Reason in the Enquiry after Truth," "First Principles of Geography and Astronomy," and "Improvement of the Mind." He is best known as the author of numerous beautiful hymns and psalms, many of them being still in use. These include "Joy to the World, the Lord has Come," "O God, Our Help in Ages Past," "Come, Holy Spirit, Heavenly Dove," and "Before Jehovah's Awful Throne." "Hush, My Dear; Lie Still and Slumber" is one of his many beautiful cradle hymns. A monument was built to his memory in Westminster Abbey. Southampton has a memorial hall that was dedicated to him.

WATT TYLER, an English soldier and the leader of a rebellion in 1381, in the reign of Richard II. The rebellion was occasioned by a poll tax levied on all persons over fifteen years of age, an act of Parliament which was almost universally unpopular among the people. Tyler became the leader of a band of insurgents, which afterward grew in numbers until an organized force of 100,000 men was obtained. This medley of rebels marched upon London and took possession of the Tower. While there they caused the death of the Archbishop of Canterbury. The king met Tyler at Smithfield. where he was stabbed by William Walworth, mayor of London, for apparent insolence in the presence of the king. Though relief was promised and the rebels dispersed, many of them were afterward severely punished for resisting renewed efforts to enforce the poll tax law.

WAUKEGAN (wa-kē'gan), a city in Illinois. county seat of Lake County, 36 miles north of Chicago, on the Chicago and Northwestern Railroad. It is situated on a prominent bluff at the west shore of Lake Michigan, having a general elevation of about 100 feet above the lake, and is a favorite resort and summer residence for citizens of Chicago and Milwaukee. The chief features include the county courthouse, the public library, the high school, and the Masonic Temple. Sheridan Drive is a beautiful public drive along the lake front. It has electric street railways, waterworks and sanitary sewerage. The manufactures include wire, pumps, sugar, earthenware, vehicles, starch, and farming implements. Waukegan has a good harbor and regular connections by steamers in the summer months. It is the center of a large trade in live stock, cereals, and merchandise. Waukegan was settled in 1835 and incorporated as a city in 1859. Population, 1900, 9,426; in 1910, 16,069.

WAUKESHA (wa'ke-sha), a city of Wis-



(Opp. 3107) OCEANIC WAVES BEATING AGAINST THE COAST.

Coast of the Bay of Fundy. Notice the Lighthouse.

Coast of Maine, U. S.

consin, county seat of Waukesha County, 18 miles west of Milwaukee, on the Fox River. It is on the Wisconsin Central, the Chicago and Northwestern, and the Chicago, Milwaukee and Saint Paul railroads. Numerous mineral springs make it a favorite summer resort for pleasure seekers and invalids. Water from these springs is shipped to many parts of the United States. The city is surrounded by a fertile agricultural country, which contains extensive quarries of excellent building stone. Among the noteworthy buildings are the county courthouse, the public library, the high school, the Carroll College, and the State Industrial School for Boys: It has manufactures of flour, ironware, machinery, utensils, cigars, and clothing. The streets are improved by pavements, waterworks, and street railways. It was settled in 1836 and incorporated in 1848. Population, 1910, 8,470.

WAUSAU (wa'sa), a city of Wisconsin, county seat of Marathon County, on the Wisconsin River, 180 miles northwest of Milwaukee. It is on the Chicago and Northwestern and the Chicago, Milwaukee and Saint Paul railroads and is surrounded by a fertile farming and stock-raising region. In the vicinity are extensive stone quarries, mineral deposits, and large tracts of valuable timber. Among the features are the city hall, the county courthouse, the post office, the public library, the asylum for chronic insane, and the Marathon County Training School for Teachers. The manufactures include lumber products, furniture, clothing, cigars, ironware, and machinery. An abundance of motive power is obtained from the Wisconsin River. It has brick and asphalt pavements and street railways. The trade in farm produce and merchandise is extensive. It was settled about 1850 and incorporated in 1872. Population, 1910, 16,560.

WAVE, the name applied to an advancing ridge or swell on the surface of a liquid, due to any force which causes the particles to be set in motion. Waves are either visible or invisible, depending upon whether they are apparent to the vision. Visible waves are caused when the surface of water is set in motion by the friction of the wind. Invisible waves result when a body is agitated by some force and consist of minute vibrations. They manifest themselves by their results, as in heat, light, and sound. If a tightly stretched wire or string, such as a piano wire or a violin string, is moved out of its position of rest momentarily, it is caused to move to-and-fro like a pendulum. This is true when the sides of a bell are struck. In either case sound waves are produced. The number of complete vibrations made by a vibrating body in one second is termed the frequency of its vibration, and the distance through which a wave moves in a given time is called the velocity. Sound waves travel in the air with the same velocity, whether they are the short waves which produce the shrill sounds, or the long waves which produce the grave tones. On the other hand, light is caused by a wave motion in the luminiferous ether, and heat is produced by the rapid to-and-fro motion of the molecules in a body.

Waves upon the surface of water result when the particles are raised by the wind and the surface is quieted, or assumes a condition of rest, through the force of gravity. In deep water the liquid mass does not advance, but the movement up and down is a local vibration. Apparently the wave progresses, but this is true only of the form, and is similar to the apparent motion of the thread of a screw when it is turned. The distance between the crests of two succeeding waves is called a wave length, and the corresponding parts of two different waves are their like phases. Wave motion in some parts of the sea is very complicated. A tidal wave may be moving steadily toward the west, distant storms may cause waves to move upon it, and ripples from the breeze then blowing may diversify the surface. This causes what is known as the interference of waves. Breakers do not occur in deep water, but are due to friction on the bottom of the sea, the effect being to retard the base of the wave while the crest rolls forward until a break occurs. Tidal waves are not noticeable on the surface of the ocean, but in some places become extremely high, sometimes twenty to forty feet, especially where the current flows into an estuary or a narrowing inlet. The waves of the ocean, due to heavy winds, frequently rise to heights of forty feet above the general level.

WAX, a solid fatty substance allied to the fixed oils and fats, derived both from animal and vegetable sources. It differs from the fats in having greater hardness and a higher melting point. True wax contains no glycerin, does not dissolve in water, and gives off a bright flame in burning. The specific gravity is .96 and the melting point is 155° Fahr. When its temperature is raised to 86°, it may be molded into any form by the hand. The term wax was formerly restricted to beeswax, but it is now extended to various bodies possessing similar characteristics, found widely diffused on various parts of plants, as on the leaves of some species, in the pollen of some flowers, and in many kinds of fruits. Beeswax is the principal insect wax. It is the product made by the honey bee in building its honey cells. It is constructed of the sweet juices of plants and in a natural state has a light yellow color, but when separated from the honey and bleached it becomes a beautiful white. Beeswax was formerly an important product for making candles, but its use for that purpose has been quite largely replaced by stearine. Other means of lighting, such as mineral oil and electricity, have largely superseded it as a lighting agency. However, it is still used for that purpose, for models in

casting, for statues in museums, and for wax fruit and flowers.

The chief vegetable waxes include myrtle, or bayberry, wax, which is made from a thin coating on the berries of the bayberry tree, and the palm wax, obtained in Columbia as an exudation on the surface of the growing leaves of the carnauba palm. Chinese wax is a secretion deposited by an insect closely related to the lac, and is found as a white coating on the branches of several species of trees. It is a highly important article of trade in China and Japan, where it is utilized for medicinal purposes and candle making. Cuba wax, which is imported from Cuba, resembles Chinese wax. It is somewhat softer than beeswax and may be dissolved in warm ether and oil of turpentine. Japanese wax is obtained from the small stone fruits of several species of rhus cultivated in Japan. Mineral wax is a natural product and is employed in the manufacture of candles. It is found oozing in small quantities from rocks of coal formation, chiefly in California, Rumania, Austria, and Scotland. Sealing wax is a commercial product of importance, but is not properly a wax. Wax is employed to a considerable extent in making figures in imitation of sculptures, especially those of human beings.
WAXAHACHIE, a city of Texas, county

seat of Ellis County, thirty miles south of Dallas, on the Missouri, Kansas and Texas and other railroads. It has cotton gins, flour mills, grain elevators, and a large trade in merchandise and farm produce. Population, 1910, 6,205.

WAX PALM, a species of trees native to Colombia, which is noted for its secretion of a resinous substance, composed of one part of wax and two parts of yellow resin. trees grow at elevations ranging more than 3,000 feet above the sea and attain a height of 150 to 175 feet. The resinous secretion covers the trunk, but is found more or less abundantly on the leaves, and is obtained by felling the tree. A large tree yields twenty to thirty pounds, obtained by scraping. The wax is used extensively in making candles and is known in the market as Brazilian wax, carnauba, or palm wax.

WAX PLANT, a class of plants of the milkweed family, so called from the waxlike appearance of the flowers and leaves. Most of the species are climbing plants, throwing out aërial rootlets. The leaves are opposite and fleshy and the flowers are sweet scented, growing in dense umbels. Several species are highly prized as house plants. The honeyworts and begonias belong to this class of plants. They take root readily and are easily cultivated in

windows.

WAXWING, a class of birds native to North America and Europe, so named from the secondary wing feathers and the tail feathers being tipped with horny appendages resembling red or yellow sealing wax. The plumage is mainly brown and the head is decorated with an erectile crest. Most species are remarkable for their irregularity in migrating. Though all are birds of passage, they seldom visit the same

summer quarters or winter retreats. Two species are native to North America, which some writers class with the flycatchers and others are classed with the chatterers. The cedar bird is a familiar North American species, but it is somewhat smaller than the waxwing The Bohemian waxproper. wing is the most widely diffused of the European species, visiting Northern Europe in the spring and migrating to Northern Africa and Southern



COM MON WAXWING.

Europe in autumn. It has a weak, whistling song and is easily tamed. The food consists of berries and insects.

WAYCROSS (wā'krŏs), a city in Georgia, county seat of Ware County, 60 miles west of Brunswick, on the Atlantic Coast Line and the Atlanta and Birmingham railroads. The surrounding country is heavily timbered and produces live stock, cereals, and tobacco. Among the features are the county courthouse, the high school, and many fine churches. The manufactures include cigars, smoking tobacco, earthenware, and machinery. It has a system of sanitary sewerage, telephones, and waterworks. Population, 1900, 5,919; in 1910, 14,485.

WAYLAND (wā'land), Francis, educator and author, born in New York City, March 11, 1796; died in Providence, R. I., Sept. 30, 1865. He studied medicine and theology at Union College and in 1816 was admitted to the Baptist ministry. The following year he became tutor of Union College, where he labored successfully until 1821, when he was called as pastor to the First Baptist Church, Boston. He was made president of Brown University, in 1827, and filled that position with the highest advantage to the university for 28 years. Wayland is noted for his ability as a lecturer, orator, and writer of numerous works. His best known writings include "Elements of Moral Science," "Limitations of Human Reason," "Duties of an American Citizen," "Intellectual Philosophy," "Political Economy," "The Collegiate System in the United States," "Memoirs of Thomas Chalmers," "Salvation by Christ," and "Sermons to the Churches.'

WAYNE (wan), Anthony, eminent general, born in East Town, Pa., Jan. 1, 1745; died in Erie, Pa., Dec. 15, 1796. He studied in Philadelphia and afterward became a land surveyor. From 1774 to 1775 he was a member of the Pennsylvania convention, was made a member of the committee of safety in the latter year, and at the beginning of the Revolutionary War was commissioned colonel of a Pennsylvania regiment. He was slightly wounded while commanding in the Battle of Three Rivers, Canada, but soon after took charge of his command at Ticonderoga. In 1777 he was made



ANTHONY WAYNE.

brigadier general, commanded under Washington in New Jersey, and led the right wing at Germantown. At Valley Forge, in the winter of 1777-1778, he rendered efficient service on foraging raids within the British lines and in the latter year served at Monmouth. In 1779 he conducted an army of 1,200 men up to Stony

Point, on the Hudson, without being observed, and by a gallant bayonet charge compelled the garrison to surrender. This brave exploit caused Congress to vote him a gold medal, and he was henceforth known as "Mad Anthony Wayne." Subsequently he assisted in the capture of Cornwallis at Yorktown and in 1782 took possession of Charleston, S. C. In 1783 he was made major general, in 1784 served in the Pennsylvania Legislature, and in 1792 commanded a

force in the Northwest Territory. He built a fort on the present site of Fort Wayne, Ind., and in 1795 made a treaty of peace with the Indians. His death occurred while serving in Pennsylvania. A marble monument was erected to his honor in Radnor cemetery, near East Town, in 1809, by the Pennsylvania Society of the Cincinnati.

WAYNESBORO (wānz'būr-ō), a borough of Pennsylvania, in Franklin County, 48 miles southwest of Harrisburg, on the Western Maryland and other railroads. It is important as a manufacturing and commercial center. Among the chief products are flour, pottery, furniture, machinery, engines, farm and dairy implements, and fertilizers. It has a number of fine schools, several academies, and numerous

churches. Waynesboro, being located near South Mountain and Antietam Creek, was on the route of the Confederate army when passing to Gettysburg. Population, 1910, 7,199.

WEALTH, a collective term employed in common speech to designate riches, such as a large possession of money, goods, or lands. It is used in political economy to describe such objects as have utility and can be exchanged. Most writers apply a threefold test in determining whether commodities should be classed as wealth. They are utility, difficulty of attainment, and transferability. All objects having these three essential characteristics are classed as wealth. Although many others may have

value, they are not regarded wealth in an economic sense. Thus air, health, and time, though highly essential, are not wealth in an economic sense, while wheat, houses and land are classed as wealth. Some writers speak of skill, intelligence, and all mental and physical habits that facilitate the production of wealth as immaterial wealth, while all the objects answering to the threefold test stated above are classed collectively as material wealth. Since material wealth can be passed from one person to another, it is implied that one can have a right of property in it, that is, one may own it. Labor is the only source of wealth, and by it alone can be increased the individual and national wealth. See Capital.

WEASEL (we'z'l), a group of quadruped mammals of the Northern Hemisphere, which includes a number of widely diffused species. The body is slender, usually about eight inches long and three inches high, and the back generally is much arched. The tail is about three inches long, the legs are short, the ears are small and rounded, and the fur is fine and close. When irritated or alarmed, they emit a disagreeable odor. Most species are reddish-brown above and pure white underneath, and those in cold regions turn completely white in winter. The common weasel is native to the region ex-



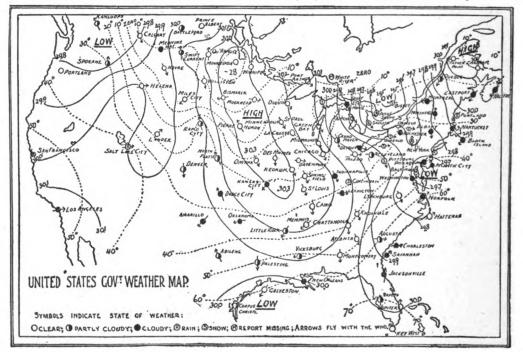
WEASEL IN SUMMER.

tending from the Atlantic Ocean to Nebraska and northward. They feed on rats, mice, moles, and small birds. In some regions they are a pest to poultry. Not only can the weasels pursue their prey through very small holes and crevices of rocks, but they are able to climb the trunks and branches of trees with rapidity and swim with perfect ease and safety. Their fur is highly valuable in making wearing apparel. They build their nests of herbage and dried leaves or in a hollow tree, where they rear four to six young, which the mother defends with much devotion. An American species known as the fisher weasel is about two feet long. The bridled weasel of Texas and

Mexico is distinguished by several white spots on the head. The polecat, sable, ferret, ermine, mink, marten, skunk, otter, and stoat are allied animals.

WEATHER BUREAU, an organization maintained by the government for making meteorological observations, predicting weather and storms, and reporting atmospheric phenomena for the benefit of mankind. Bureaus of this kind are supported by the leading governments of the world. They have been the means of obtaining much useful information in regard to the occurrence of rainfall, frost, floods, storms, and other phenomena of the weather which materially affect industry. Observations of this kind have been made and reported in the United

daily weather forecasts to more than 2,250,000 addresses. Most of these are reached by telephone without expense to the government, but a large number are reached by mail, by train service, and by railroad telegraph. The division of climate and crops reports data in regard to rainfall, temperature, and other climatic conditions which affect the agricultural and other interests. The division of river and flood service obtains and distributes information relative to rain, snow, ice, and other phenomena which may stimulate or retard navigation and commerce. Other divisons include those of publications, supplies, and records. The Monthly Weather Review, which is issued regularly by the bureau, is an official publication



States since 1818, when meteorological reports were first issued by the surgeon-general of the army, but the weather bureau as now organized dates from 1891, when the organization was made a part of the Department of Agriculture. Canada, Great Britain, Germany, Japan, and France likewise have weather bureaus of a very high class.

Divisions. The weather bureau as at present organized includes several divisions that have charge of special lines of duty. For instance, the forecast division gathers information and makes predictions as to the weather at definite times each day. These forecasts are based upon reports received daily from the stations which are distributed in all parts of the country. They cover a period of from 20 to 48 hours and are sent out in the form of weather maps, or charts. The weather bureau of the United States sends

for distributing information of value to farmers and stock raisers. It is sent free upon application to any one who may be interested in receiving reports at stated times.

Foretelling the Weather. A system of rules has been adopted for use with aneroid barometers. These rules have special reference to a steady barometer, a rising barometer, and a falling barometer. A steady barometer, when the weather is dry and the temperature is seasonable, indicates a continuance of very fine weather. A rising barometer, when rising rapidly, indicates unsettled weather, while a gradual rise indicates settled weather. A rise with dry air and cold increasing in summer indicates wind from the northward, but, if rain has fallen, better weather may be expected. Southerly winds accompanied by a rise indicate fine weather. A rise with moist air and a low tem-

perature indicates wind and rain from the northward. A falling barometer, when rapid, indicates stormy weather. In winter, when the fall is accompanied with dry air and increasing cold, it is liable to snow. A fall after very calm and warm weather indicates rain with squally weather. The rules in general use are quite elaborate, but those indicated are examples of the more important ones.

· UTILITY. Actual experience has demonstrated the utility of a well organized and conducted weather bureau service. Regular reports are received daily by telegraph, at 8 A. M. and 8 P. M., and the forecasts are based upon these for the next 36 hours. These telegrams are sent from all parts of the country, being forwarded by thousands of voluntary and special observers. After they are tabulated with much care, they are prepared for publication in newspapers and to be sent out on postal cards and by telegraph. Signals based upon these reports are displayed upon the principal government buildings and elsewhere in many parts of the country. In this way much profit has been obtained by those who are interested in commercial enterprises, since they may modify their plans so as to be less unfavorably affected by severe atmospheric conditions, or may take advantage of favorable prospects. See Signals.

WEATHERFORD (weth'er-ferd), a city of Texas, county seat of Parker County, situated in a farming and stock-raising region, 65 miles west of Dallas. It is on the Texas and Pacific, the Gulf, Colorado and Santa Fé, and other railroads. The noteworthy buildings include the county courthouse, the high school, the Saint Joseph's Academy, the Weatherford College, and the Texas Female Seminary. Among the industries are grain elevators, cotton gins, flouring mills, potteries, stock yards, and machine shops. It has a growing trade in merchandise and farm produce. Population, 1910, 5,074.

WEAVER (wev'er), James Baird, public man, born in Dayton, Ohio, June 12, 1833; died Feb. 6, 1912. He graduated from the Cin-



JAMES B. WEAVER.

cinnati College in 1854, removed to Iowa in 1856, and served with distinction in the Union army, attaining to the rank of brigadier general. A Lter the close of the war he became a district attorney, in 1866, and afterward edited the Iowa Tribune, at Des Moines. In 1878

he was elected to Congress as a Greenback candidate and in 1880 was the candidate of

that party for President, receiving 308,578 votes. He was reëlected to Congress in 1884 and again in 1886, and in 1892 became the presidential candidate of the People's party, receiving 1,030,-128 of the popular votes and 23 of the electors. General Weaver attained a wide reputation as an able champion of the labor issues and of bimetallism. In three campaigns he was an active and devoted supporter of Bryan for the Presidency. His life-size portrait was placed in the Iowa Historical Building in 1908.

WEAVER BIRD, a class of birds of the finch family, which are native to the warmer climates. They are noted for their habit of



WEAVER BIRDS AND SOCIAL WEAVER BIRD'S NESTS.

hanging a closely woven nest in the form of a pouch from the branches of trees. About 250 species have been described by naturalists. They are more or less widely distributed in Australia, Africa, and Asia. Some weaver birds build their nests singly, but most species unite in communities and occupy a large structure in common. The social weaver birds of Africa belong to the latter class, their nests being built under a common overhanging roof, which all of a group unite to construct, but afterward each pair completes its own nest. Several hundred separate nests are often built after this manner, and they are usually constructed on trees which are difficult to reach by intruders. The individual nests form separate compartments and are entered by different passages. Some species build single, pouchlike nests, containing one compartment, which they enter from

3112

below, and to secure protection against monkeys, snakes, and squirrels suspend them from small branches hanging over water. The *Philip*pine weaver bird is native to Southeastern Asia and the paradise weaver bird is found in India. The latter is one of the most beautiful and the

largest of the species. Its general color is black, with markings of orange of various shades. It is a favorite cage bird, being noted for its beautiful plumage and delightful song.

WEAVING (wev'ing), the art of interlacing threads of different kinds, such as silk, wool, or cotton, thus forming a woven fabric. The loom is the frame or machine employed in weaving, and in its simpler form has come down to us from the nations of antiquity. Though clothing was first made of the skins of animals and of the leaves of trees, it is evident that spinning and weaving were practiced in the Stone Age of man. Evidences of this have been found in the lake dwellings of Switzerland, where spindle whorls and fabrics of flax were secured from among the remains. Weaving is represented in the sculptures on Egyptian tombs at Thebes. Women and slaves were highly skilled in hand weaving in ancient Phoenicia and Greece.

Although the hand looms of the ancients were everywhere rude, they turned out excellent fabrics, many of them equal to the best made at the present time. The chief objection to the hand loom was that too much time was consumed in turning out the product, hence the improvement and invention of the power loom became an important subject for study. Weaving was not developed in England until in 1732, when a number of weavers settled there from the continent, and Charles Wyatt, of Birmingham, in 1738, patented a machine for spinning by means of rollers. In 1784 Cartwright invented the power loom, but it has been successively improved and other machines have been invented by which weaving has become a rapid process under the application of steam and electric power.

In all kinds of weaving, whether plain or figured, two sets of threads are employed, which traverse each other at right angles in the web. The one set of threads is called the woof, or weft. They are made to pass alternately under and over the other system of threads called the web, warp, or chain. In weaving fabrics of any kind the warp threads are fastened in the loom, the number used depending on the fineness and width of the cloth. The woof or cross threads are wound on bobbins or spools and are placed in a shuttle. The warp threads, being stretched in the loom, are acted on by a movement that lifts and lowers alternate threads, thus allowing the shuttle to pass from side to side between the two sets of threads. When the woof thread has been carried between the warp threads, the lower threads are raised and the upper threads are lowered, after which the shuttle is returned. In this manner the shuttle consecutively carries the woof thread to and fro until the entire piece of cloth is completed. The shuttle is moved by hand in the hand looms and the threads are alternated by the action of the foot, but in power looms all the movements are by machinery.

Plain weaving consists of alternating every other warp thread. Besides this common method, many other kinds of weaving may be mentioned, such as taking up one thread and leaving two or three, interlacing to form a double cloth, and pile weaving. The last named process is employed in making velveteens, velvets, and Turkey carpets. It consists of leaving pile warps above the surface in the form of loops, which are afterward cut by an attached mechanism to form the pile. Many other forms of weaving are utilized, such as are used in producing figured goods, and in interweaving different kinds of threads and threads of various colors. Weaving is applied in a more or less modified form in making cotton and woolen textiles, ribbon, carpet, silk goods, tapestry, damask, and velvet.

WEBB, Alexander Stewart, soldier, born in New York City, Feb. 15, 1835; died Feb. 12, 1911. His father, James Watson Webb, sent him to the West Point Military Academy, where he graduated in 1855. In 1857 he was made professor of mathematics at West Point and at the beginning of the Civil War entered the Union army, taking part in the Battle of Bull Run. He commanded through the peninsular campaign in 1862, led a brigade at the battles of the Wilderness and Spottsylvania in 1864, and served on the staff of General Meade from 1864 to the close of the war. In 1865 he was made major general of the United States army, became professor at West Point shortly after, and in 1869 was elected president of the College of the City of New York. He published "The Peninsula: McClellan's Campaign of 1862." Hobart College conferred a degree upon him in 1870.

WEBB, James Watson, journalist and diplomatist, born in Claverack, N. Y., Feb. 8, 1802; died in New York City, June 7, 1884. He was educated at Cooperstown, N. Y., and in 1819 was commissioned as second lieutenant in the United States army. In 1826 he resigned from the army and became editor of the New York Morning Courier, which was consolidated with the New York World in 1861. Webb was appointed minister to Austria in 1849, but the Senate refused to confirm the appointment. He served as minister to Brazil from 1861 to 1870 and in the meantime negotiated a treaty for the removal of French troops from Mexico. He is the author of "Slavery and Its Tendencies," " Life and Adventures in the Rocky Mountains," and "National Currency."

WEBB, Sidney, author, born in London, England, July 13, 1859. He was trained by private tutors and at the London College, and subsequently attended universities in Germany and

Switzerland. In 1885 he was called to the bar, held several municipal and government offices, and for some years was a lecturer on economic branches in the London School of Economics and Political Science. His writings consist mostly of works devoted to labor and political questions. They include "Socialism in England," "History of Trade Unionism," "The Eight Hours' Day," "The Coöperative Movement in Great Britain," "Industrial Democracy," and "The History of Liquor Licensing."

WEBB CITY, a city of southwestern Missouri, in Jasper County, eight miles west of Carthage, on the Missouri Pacific and the Saint Louis and San Francisco railroads. It has a growing trade in cereals, minerals, and fruits. The features include the high school, the public library, and many fine churches. The surrounding country contains deposits of zinc and lead, which minerals are mined profitably. The improvements include sanitary sewerage, street pavements, waterworks, and several parks. Fruit gardens and orchards are profitable in the vicinity. Population, 1900, 9,201; in 1910, 11,817.

WEBER (vā'bēr), Carl Maria Friedrich Ernst von, musical composer, born near Lübeck, Germany, Dec. 18, 1786; died June 5, 1826. He



descended from a f a m i l y which is noted for its musical talent and showed early inclination to become a master musician. His father being a musical director, it became necessary that his instructors should be changed with each change of residence, but he studied principally under Michael Haydn at Salzburg

CARL VON WEBER.

and Kalcher at Munich. He composed an opera. called "Power of Love and Wine," when but thirteen years of age and the following year completed his "Forest Maiden," which was soon after put on the stage. In 1804 he became conductor of the opera at Breslau and two years later was engaged at Carlsruhe, in Silesia, by Prince Eugene of Württemberg. He was musical director of the opera at Prague from 1813 to 1816 and in the latter year founded the German opera at Dresden. His most famous opera, "Archer" (Der Freischütz), was brought out at Berlin in 1822 and soon after was produced on the stage at Vienna, Paris, and London. In 1823 he completed his "Euryanthe," which was rendered amid much enthusiasm in Vienna, and soon after he accepted an invitation to visit London, where he produced his famous "Oberon." He died while in London, but his body was removed to Dresden, where a fine statue of him

was erected in 1860. Weber is classed among the most eminent musical composers of the last century and is the author of many operas, songs, and concertos. His productions not already named above include "Peter Schmoll and His Neighbors," "Abu Hassan," "The Hunter's Bride," "Sylvana," "Guide of the Spirits," "Contest and Victory," "The First Tone," "Preciosa," and "Invitation to the Waltz."

WEBSTER (web'ster), a town of Massachusetts, in Worcester County, on the French River, fiteen miles south of Worcester. It is on the Boston and Albany and the New York, New Haven and Hartford railroads. The place was incorporated in 1832. Population, 1910, 11,509.

WEBSTER GROVES, a city of St. Louis County, Mo., 10 miles west of St. Louis, on the Missouri Pacific Railway. The place is popular as a residential center and has electric railway communication with St. Louis. It was settled in 1866 and incorporated in 1894. Population, 1910, 7,080.

WEBSTER, Daniel, statesman and orator, born in Salisbury (now Franklin), N. H., Jan. 18, 1782; died in Marshfield, Mass., Oct. 24,

1852. He descended from the family of Thomas Webster, a Scotchman, who settled in New Hampshire in 1636. His father, Ebenezer Webster, was a captain in the French and Indian Wars. At the time of his youth the schools were still in a very primitive condition and for



DANIEL WEBSTER.

much of his early training he was indebted to his mother, who was ambitious that her children should obtain an education. Young Webster, being of a studious nature, made considerable progress in the elementary branches by study at home and in a few short winter terms of school, and in 1797 his father succeeded in securing ample money to send him to Dartmouth College. He remained in college four years, though not without working and teaching school to raise sufficient money to defray his expenses, and in 1801 graduated. Soon after he secured a position as teacher at an academy in Maine with a salary of \$350 per year, but devoted a part of his savings to aid a brother in his college work, and afterward entered upon the study of law. In 1805 he was admitted to the Massachusetts bar in Boston and began the practice of that profession in Boscawen, N. H. Soon after he removed his office to Portsmouth. then the largest city in the State, where he rapidly rose as a leader in his profession.

Webster was elected to Congress in 1812 and took his seat in the special session of May, 1813, serving on the Committee on Foreign Affairs. His first speech in Congress was delivered on June 10, 1813, and was based on a resolution touching the decrees of Berlin and Milan. The remarkable display of historical knowledge and oratorical power sent a thrill through the nation, particularly because Webster was at that time unknown outside his own State, and he soon after made equally powerful speeches in favor of repealing the embargo law and increasing the navy. In 1814 he was again elected to Congress and soon after removed to Boston, where he devoted himself entirely to the law profession after the expiration of his term of office. Many important cases were brought to Webster and he attained to the front rank as a constitutional lawyer. His first celebrated case was that affecting the charter of Dartmouth College, which was heard before the United States Supreme Court, in 1818, and involved the obligation of contracts and the constitutional powers of the country. In 1820 he was chosen to deliver the oration on the 200th anniversary of the landing of the Pilgrims at Plymouth, when, by his masterful oratory, he thrilled the spirit of American patriotism. Another remarkable address was delivered in 1825, fifty years after the Battle of Bunker Hill, on the occasion of laying the corner stone of the Bunker Hill monument. In 1826 he delivered another great address, that on the fiftieth anniversary of the Declaration of Independence. These addresses placed him at the head of orators in America.

Webster was reëlected to Congress in 1822 and served continuously until 1827, when he was chosen United States Senator for Massachusetts. He remained a member of the Senate until his death, except while serving as Secretary of State. His senatorial service covered 22 years, thus making his total congressional career extend over a period of 30 years. His first celebrated speech in the Senate was in favor of the protective tariff of 1828, and two years later he made his famous reply to Hayne on the Foote resolution, by which he won the title of "Expounder of the Constitution." He strongly opposed the doctrine of nullification and was often pitted against Calhoun. Next to Clay he ranked as the most prominent man in the Whig party. In 1836 he received fourteen electoral votes for the Presidency and, in 1841, was chosen by President Harrison as Secretary of State. At the death of the latter, in 1841, all the cabinet officers except Webster resigned, but he also resigned in 1843. Though this course lost him the friendship of many Whigs, it was highly important that his statesmanship should come into play in the many questions then pending between the United States and Great Britain. These included the controversy regarding the right of forcibly searching American

vessels by English seamen on the coast of Africa and the dispute concerning the boundary of Maine, the latter being adjusted by the Webster-Ashburton Treaty in 1842.

In 1845 Webster reëntered the Senate, where he made several famous speeches on the Oregon question and later on the compromise measures proposed between the North and the South regarding slavery. He was mentioned prominently for the Presidency in 1848, and from 1850 to 1852 again served as Secretary of State. In 1852 he was mentioned for President, but the nomination was given to General Scott, whom he refused to support. The keynote of Webster's statesmanship was the preservation of the Union, and, while opposing the nullifiers as enemies, he denounced the abolitionists. He was fond of outdoor exercise, enjoyed a large personal friendship, and was a man of fine physique and remarkable talent. His speeches were published in 1851 and in 1858 two volumes of private correspondence were made public. A number of his speeches are counted among the American classics. Many extracts from them have been published in text-books that are used by children of the public schools. An imposing statue of Webster, executed by Thomas Marshfield, is situated in Central Park, New York.

WEBSTER, Noah, lexicographer, born in West Hartford, Conn., Oct. 16, 1758; died May 28, 1843. He was the son of a farmer and his early years were spent in work on the farm, while his winters were given to study in the district school. In 1772 he undertook the study of the classics under Nathan Perkins, a minister, and two years later entered Yale University. He began the study of law in 1778, but was compelled to sustain himself by teaching school. While teaching at Goshen, N. Y., he published "Grammatical Institute of the English Language," a work treating of spelling, reading, and grammar. In 1785 he delivered a course of lectures on the English language in many leading cities, and in 1787 advocated the new constitution by publishing "Leading Principles of the Federal Constitution." He established a law office at Hartford, in 1789, and soon after aided in founding the Commercial Advertiser and the New York Spectator. In 1798 he settled at New Haven, Conn., where he was chosen to the General Assembly of the State, and in 1812 became the first president of Amherst College. He made a tour to Europe in 1824 to consult the leading libraries in regard to his work of preparing a large dictionary, but returned to America the following year. His complete dictionary, entitled The American Dictionary of the English Language, was published in 1828 and an enlarged edition appeared in 1841. The most popular of his smaller books was his "Webster's Spelling Book," of which about 75,000,000 copies were sold. Other works not named above include "Dissertations on the English Language," "Sketches of American

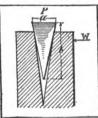
Policy," "The Rights of Neutrals," "The Revolution in France," and "A Collection of Papers on Political, Literary and Moral Subjects."

WEBSTER-ASHBURTON TREATY. See

Ashburton Treaty.

WEBSTER CITY, a city of Iowa, county seat of Hamilton County, 72 miles north of Des Moines. It is situated on the Boone River and on the Illinois Central and the Chicago and Northwestern railways. The surrounding country produces large quantities of cereals and live stock. Among the chief buildings are the county courthouse, the Kendall Young Library, the Jacob Funk Hospital, the city high school, and a number of fine churches. It has manufactures of cigars, canned goods, clothing, and machinery. Brick pavements, waterworks, and sanitary sewerage are among the public utilities. The first settlement in the vicinity was made in 1857. Population, 1905, 4,797; in 1910, 5,208.

WEDGE, one of the simple mechanical powers, being a modified form of the inclined plane. In the wedge the plane is moved under the



DOUBLE WEDGE.

weight, instead of moving the weight up the plane. It is used for splitting wood or stone, in lifting vessels in the dock, and in pressing oils or juices from seeds. Two classes of the wedge are in use, the single wedge and the double wedge. The latter is the more common type

and is shown in the illustration. The force of a wedge is very great, since it is driven into position with a hammer or sledge. Axes, nails, pins, and knives are made on the principle of

WEDGWOOD (wej'wood), Josiah, distinguished potter, born in Burslem, England, July 12, 1730; died Jan. 3, 1795. He was the son of Thomas Wedgwood, a potter in Burslem, and from him learned that trade. In 1751 he became manager of a pottery in the vicinity of his native town, and eight years later started into the business on an independent scale. He was not satisfied with the results obtained in the pottery business, but made many improvements, such as manufacturing a cream-colored porcelain, which became known as queensware. His success in producing ornamental pottery was the means of bringing him a large fortune. He founded a village called Etruria, in 1771, where he developed the largest pottery enterprise known in England up to that time. It is due to Wedgwood that the Staffordshire potteries became famous. He reproduced the famous Portland Vase, executed paintings on pottery, and originated the Wedgwood ware, a superior grade of semivitrified pottery capable of taking on delicate colors. It is valuable because it does not contain any artificial gloss.

WEDNESDAY (wenz'da), the fourth day of the week, named from Woden or Odin, the chief Scandinavian deity. According to an old superstition, Wednesday was considered neither

particularly lucky nor dangerous.

WEED, Thurlow, journalist, born in Cairo, N. Y., Nov. 15, 1797; died in New York City, Nov. 22, 1882. He became a cabin boy on a Hudson River sloop, when he was ten years of age, and two years later entered a printing office in Catskill, N. Y. In 1812 he enlisted in the army, serving on the northern frontier of New York until 1815, when he entered a printing office in New York City as composi-He became editor of the Agriculturist, a periodical devoted to farming and dairying, which he published from 1819 to 1821, and afterward founded the Onondaga County Republican at Manlius, N. Y. In 1824 he became editor and owner of the Rochester Telegraph and two years later entered the Legislature as an Anti-Mason. After serving two terms in the Legislature, he established the Albany Evening Journal, which he published for 35 years. As an editor he opposed the administration of President Jackson and the nullification policy of Calhoun and was active in promoting the election of William Henry Harrison in 1840. He advocated the nomination of Henry Clay for the Presidency in 1844, General Scott in 1852, and John C. Frémont in 1856. In 1860 he promoted the candidacy of Abraham Lincoln and the following year went to Europe to aid in maintaining the neutrality of the European nations in the Civil War. He became editor of the New York Commercial Advertiser in 1867. His writings include "Letters from Europe and the West Indies," "Reminiscences," and "Autobiography." The last mentioned was edited and published by his daughter in 1884.

WEEDS, the general name applied to plants that are troublesome in cultivated grounds, owing to their persistence and rapid growth. Many weeds are obnoxious because they take up the fertility of the soil which should be utilized in supporting the cultivated plants, and in some cases they suppress the useful variety. Others are injurious to stock, or produce seed that decreases the value of cereals when mixed with them. The cocklebur, morning-glory, milkweed, Canada thistle, and Russian thistle are obnoxious weeds that are difficult to destroy even by careful cultivation. Foxtail is a widely distributed weed, but it is not particularly injurious, unless it is permitted to grow so densely that it will smother the cultivated plants. Burdock is a deeply rooted plant that is difficult to destroy. Wild mustard and dandelion are classed with the obnoxious weeds, but the last mentioned is cultivated for its flowers in some localities. In general it is best to cultivate the ground carefully at or before the time of seeding, since it is much easier to keep the ground clean than to destroy the weeds after they have become firmly rooted. Where weeds are permitted to mature from year to year, they fill the ground with seeds, thus making it more difficult and undesirable for cropping. Fields in this condition are greatly benefited by seeding with clover, timothy, or other useful grasses.

WEEK, the space of seven consecutive days, especially the cycle beginning with Sunday, the first day of the week, and ending with Saturday, the last day. The week has been in use in eastern countries for reckoning time since prehistoric times, but was not introduced into the Roman calendar until after the reign of Theodosius, in the 4th century A. D. It is probable that the week was first instituted as a division of the periodical month, corresponding to the four quarters of the moon, or about seven and threeeighths days. The days of the week were named from the astrological notion that each of the seven heavenly bodies best known to the ancients had a modifying influence on the days according to the distance from the earth, and each body was regarded as presiding over an hour of the day. Hence, the Roman week was divided into seven days. These days were named in order from the sun, the moon, Mars, Mercury, Jupiter, Venus, and Saturn. The Jews and the early Christians applied no special names to the different days, but counted from the previous Sabbath; thus, Sunday was the first after the Sabbath, Monday the second, etc.

The Latin nations still retain the names derived from the Roman deities, but in the Germanic languages they have been replaced by names taken from those of the corresponding Germanic deities, except Sunday, Monday, and Saturday, these being still named after the sun, moon, and Saturn. Tuesday is named from Tyr, as the equivalent of Mars; Wednesday from Woden, for Mercury; Thursday from Thor, for Jupiter; and Friday from Freya, for Venus. The Society of Friends designates the days by their numbers, beginning with Sunday, as Firstday, Second-day, etc. Both Jews and Arabs count the day as beginning and ending with sunset. The Jews and many Christians keep Saturday as the Sabbath, while the Mohammedans observe Friday.

WEEVER (we'ver), or Stingfish, a class of small marine fishes found off the coasts of Europe, noted for the unpleasant wound they are able to inflict by the sharp dorsal spine. The weevers belong to a family of spiny-rayed fishes. They have a long body with two dorsal fins, a covering of very small scales, and a greatly compressed head. Wounds inflicted by the dorsal and opercular spines are very painful, owing to the mucous secretion being somewhat poisonous.

WEEVIL (we'v'l), an extensive genus of insects, which are distinguished by having the head elongated into a long snout or rostrum, bearing the mouth parts at the end and the an-

tennae at the sides. The various species are widely diffused and in the larval form are often highly destructive to roots, leaves, and fruits. Some species lay their eggs on the leaves of trees and afterward cut the leafstalk partly through, thus causing it to fall to the ground. The young insect feeds upon the leaves until sufficiently developed to bury itself in the ground, where it remains in the chrysalis state until the return of spring. Other species, such as the plum weevil, or curculio, attack pears, plums, cherries, grapes, peaches and apples. They lay their eggs in an opening made in the fruit by a small sting when it is quite small and, when the grub or larva is hatched, it eats its way into the stone or center of the fruit, thus causing it to fall from the tree. In this way access is obtained to the ground, which is entered by the larva, and the developed insect soon makes its appearance.

The best known species of these insects include the corn weevil, boll weevil, bean weevil, grain weevil, nut weevil, rice weevil, grape weevil, palm weevil, clover weevil, and pine weevil. All these species are more or less destructive to fruits, grains, and nuts. The pine weevil infests the pine forests of temperate and warm climates, often stripping those trees of their leaves. The pear weevil in a similar manner infests the pear tree. Turnips are subject to ravages by weevils. Though the species attacking those vegetables are quite small, they feed on both the leaves and the roots. It has been found that the best security against many species of weevils is obtained by protecting the birds that feed upon their larvae, but certain species attacking fruit may be destroyed by careful application of chemicals. See Insects.

WEIDNER (vēd'nēr), Revere Franklin, clergyman and author, born in Centre Valley, Pa., Nov. 22, 1851. He descended from German parentage and graduated from Muhlenberg College, Allentown, Pa., in 1869, and from the Lutheran Seminary, Philadelphia, in 1873. Subsequently he occupied pastorates in New Jersey and in Philadelphia. In 1878 he became professor in the Augustana Theological Seminary, Rock Island, Ill., a Swedish-English Lutheran institution of learning. He was made chairman of the faculty of the Lutheran Theological Seminary, Chicago, in 1891, and for several years was instructor of Hebrew in summer schools under the direction of William R. Harper. His "Theological Encyclotranslations include paedia," "Commentary on the Gospel of Mark,"
"Historical Theology," "Greek Text of Saint
John," "Commentary on the Hebrew Text of Obadiah," "Grammar of the New Testament Greek," "Biblical Theology of the Old Testament," Luther's "Small Catechism," "System of Dogmatic Theology of the Evangelical Lutheran Church," and Joseph A. Seiss's "Voices From Babylon."

WEIGELIA (wi-ge'li-à), an ornamental plant of the honeysuckle family, which is widely cultivated for its profuse flowers. Several species are native to China and Japan, whence they were brought to North America, but a number of species are indigenous to America. They are bushy shrubs, growing to a height of five to six feet. The leaves are oval and taper to a point. In most species the flowers are funnel-shaped and usually are white or pink in color. The Rocky Mountain Weigelia is a bush about four feet high and the southern bush honeysuckle has sessile leaves, the stalk growing about four feet high. These plants are less showy than those native to China.

WEIGHING MACHINE, a mechanism used to ascertain the weight of bodies. Since weight is the result of the attraction of gravitation upon a body, an object or body does not have the same weight on all parts of the earth's surface, owing to the fact that the force of gravity decreases as the square of the distance from the center of the earth increases. Weight is least at the Equator, since the earth bulges and centrifugal force is strongest at that place, and it is greatest at the poles, because the earth is flattened and centrifugal force is not a factor at those regions. A mass of iron which weighs 1,000 pounds at the Equator would weigh 1,005 pounds at either of the poles. The same mass would weigh 500 pounds at a point 2,000 miles below the surface of the earth and at an elevation of 1,650 miles above it, and the weight on the surface of the sun would be 28,000 pounds. However, the term weight in ordinary use does not imply the absolute heaviness of a body, but rather its heaviness as compared to a piece of metal which is taken as a standard. It will be seen from this that it is quite necessary to have a standard of weight, which is ascertained by an arbitrary rule, and the weighing is done at the same place and under the same conditions.

The platform scale is the most common weighing machine to ascertain the weight of large quantities. It makes use of a number of levers, all of which are connected with the last lever of the series, or principal lever, and this is connected by a long arm with the short arm of the weighing beam. Several weights of different denominations are fitted to be suspended from the weighing beam, which is also furnished by a sliding weight to balance the scales. Thaddeus Fairbanks of Vermont patented such a weighing machine, in 1831, and since then numerous modifications and improvements have been made. Weighing machines based on the principle of even balance are used to a considerable extent. These consist essentially of a beam balanced upon a pivot, and the object to be weighed is placed on one end while a weight is placed on the other extremity of the beam. Usually each end of the beam has a pan for receiving the weights or the objects to be weighed, and in

some forms a side beam is utilized, as in many scales used by grocers. The *steelyard* and the *torsion balance* are other forms of instruments for weighing.

WEIGHTS AND MEASURES, the means employed to ascertain exact quantity. It is necessary to have systems to compare and express mass, or quantity, as a means of effecting the exchanges which are involved in commerce, and they are likewise indispensable in the arts and sciences. All governments maintain standards of such systems and the standard units are securely preserved at the capitals. The standards now in use have been chosen arbitrarily, though in particular cases some natural rule has been followed in determining the value of the units. This may be seen from the fact that the average length of the foot, twelve inches, was made the basis of the foot among the Greeks. On the other hand, the cubit of the Jews and the Egyptians was established upon the average length of the fore arm. A law in England, passed in 1266, made 32 grains of wheat taken from the middle of the ear the basis of the English penny, while 20 pence were declared to be an ounce, 12 ounces a pound, and 8 pounds a gallon of wine. A London bushel contained 8 gallons of wine.

Apothecaries' weight is used in buying and selling medicines by prescriptions, but avoirdupois weight is employed when the drugs are not ordered by prescription. All goods are bought and sold by avoirdupois weight, except for which troy and apothecaries' weight are used. The short ton of 2,000 pounds is used commonly in the United States, while the British or long ton is employed to some extent in that country and almost exclusively in Great Britain. The latter contains 2,240 pounds, corresponding to a cwt. of 112 and a quarter of 28 pounds. The common standard of weight by which the relative value of these systems are compared is the grain, which for this purpose may be regarded as the standard of weight. Both the pound troy and that of apothecaries' weight have each 5,760 grains, while the pound avoirdupois has 7,000 grains. Below are tables of the three systems of weight mentioned:

	APO	THECARI	es' WEIG	нт.	
Lb. 1	Oz. 12 1	Dr. 96 8 1		Ser. 288 24 3 1	Gr. 5,760 480 60 20
Gross or Long	A	VOIRDUPOI	S WEIGH	IT.	
Ton. 1 Short	Cwt. 20 1	Qr. 80 4 1	Lb. 2,340 112 28 1	Oz. 35,840 1,792 448 16	Dr. 573,440 28,672 7,168 256 16
Ton-	Cwt. 20 1	Qr. 80 4	L,b. 2,000 100 25 1	Oz. 32,000 1,600 400 16	Dr. 512,000 25,600 6,400 256 16

3118

Lb.	Oz.	Dwt.	G
1	12	240	5,76
	1	20	48
	7,000 troy grains = 175 troy pounds =	1 lb. avoirdupois 144 lb. avoirdupois	
	175 troy ounces = 437½ troy grains =	1 oz. avoirdupois	
	I troy pound =	8228+1b. avoirdupois	

WEIMAR (vi'mär), a city in Germany, capital of the grand duchy of Saxe-Weimar, fifty miles southwest of Leipzig. It is beautifully situated on the Ilm River and has good railroad facilities, connecting it with the leading trade centers of Germany. The streets are finely improved by pavements, electric lights, gardens, and parks. It has systems of public waterworks and electric street railways. The most prominent buildings include the public library, with 225,000 volumes, the grand ducal palace, the Goethic townhall, the court theater, the Goethe museum, the Schiller house, and many fine schools and churches. Weimar is noted as the home of Schiller, Herder, Goethe, Wieland, and Lucas von Cranach (1472-1553), an eminent painter.

Among the adornments of the city are splendid monuments to Wieland, Schiller, Herder, and Goethe, and the last three mentioned writers were buried there. Tourists find the houses occupied by a number of these writers objects of special interest, including a number of rooms of the ducal palace, which has fine decorations and frescoes illustrating scenes from the works of these authors. Weimar has a number of manufactures, including pottery, porcelain, clothing, scientific instruments, and chemicals, but its trade is of a local character. Nearly all the inhabitants are Protestants. Population, 1915, 31,117.

WEIR (wer), Harrison William, artist and author, born in Lewes, England, May 5, 1824; died Jan. 4, 1906. His ability as a designer on wood was developed at an early age, and he produced some fine specimens in wood engraving in 1840. He is noted principally for skill in painting, an art in which he was self-taught, and in 1849 exhibited his "Dead Shot" at the British Institution. He soon became a member of the Society of Painters in Water Colors, and as a member of that association took high rank in producing landscapes and paintings of animals, flowers, and country life. His best known works include "Christmas Carol," "A Servant of all Work," "The Forester," and "Startled." He illustrated many books and prepared wood engravings for periodicals. He is the author of several writings, including "Animal Stories," "Everyday in the Country," "Bird Stories," and "Our Cats."

WEIR, Robert Walter, painter, born in New Rochelle, N. Y., June 18, 1803; died in New York City, May 1, 1889. He first received instruction in New York City, but in 1824 proceeded to Italy, where he studied for several years. In 1829 he became a member of the National Academy of Design, and three years later was elected professor of drawing in the West Point Military Academy. After holding that position for 42 years, he retired to his residence in New York City. Among his best works are "Landing of Henry Hudson," "Embarkation of the Pilgrims," "Indian Captive," "Christ in the Garden," "Pier at Venice," "View of the Hudson from West Point," "Belle of the Carnival," "Virgil and Dante Crossing the Styx," and "Our Lord on the Mount of Olives."

WEISMANN (vīs'mān), August, biologist and author, born in Frankfort-on-the-Main, Germany, Jan. 27, 1834. His father was professor of languages in the gymnasium, where he studied until 1852, when he entered the University of Göttingen. Subsequently he studied natural sciences in Vienna and Paris, and in 1861 became physician to Archduke Stephen of Austria. While engaged in that capacity, he published "Development of the Diptera," a work of much merit. Subsequently he took lectures on zoölogy in the University of Giessen and in 1866 became professor at Freiburg, in Briesgau. Weismann is noted for his extensive research in cell structure of the body and made many valuable discoveries in regard to germs, thus leading to his germinal theory. His writings include "Studies in the Theory of Descent," "Germinal Selection," "Germ-Plasm," "Essays on Heredity and Kindred Subjects," Mammalian Descent," and "Development of Sex-Cells in Lower Animals."

WELDING (weld'ing), the process by which two pieces of the same metal, at a suitable temperature, are made to unite permanently. Welding is confined chiefly to such metals as iron and platinum, but many other substances can be welded with facility, such as glass, horn, and tortoise shell. However, iron and steel are the only metals that are welded extensively in the arts. The process consists of cleaning the ends of the bars to be welded, when they are brought to a white heat, whereby they are softened. To prevent the formation of oxide, a quantity of borax, or some other flux, is put upon them. Having been brought to this suitable condition for welding, the heated ends are placed together and hammered, by which they are caused to unite so as to form sensibly but one mass, showing no appearance of the junction. Welding is done extensively in the larger shops by electricity. The heat is obtained by passing a strong electric current through the pieces of metal that are to be joined. By this process it is possible to weld copper quite as easily as iron. Pressure applied to two pieces of lead with fresh surfaces will cause them to adhere with considerable force. Powdered graphite in a dry condition may be consolidated into a coherent mass by great pressure, and the union is so complete that it may readily be cut into strips for use as lead pencils.

WELL, a deep hole of small diameter sunk into the earth for the purpose of obtaining various substances, such as water, natural gas, or petroleum. Wells for water are usually dug by hand with a spade where water is desired at no great depth, usually from ten to sixty feet. If water cannot be obtained at reasonable depths by digging, the wells are then made by boring or drilling. A well bored for water may be from six inches to two feet in diameter, but generally not more than 150 feet in depth, and the inside casing usually consists of ordinary well tile. On the other hand, drilled wells are frequently put down to great depths and usually range from 100 to 3,000 feet. They are cased in the inside with piping to prevent caving and pumps used in such wells are protected by screens. In most instances wells of this kind are lined with a casing that serves for the pump itself.

The machinery used in sinking wells by boring and drilling consists chiefly of a derrick, usually from thirty to seventy feet in height; a machine for boring or drilling, which consists of bits and drills to suit the size wanted; and a windlass for lowering and raising the drill. The machinery is operated either by horse or steam power, and steam or gasoline engines are usually employed where the well is to have considerable depth. In boring a well, the auger is turned by the engine or power acting upon the main rod, and, when the auger is filled with earth, it is raised by the windlass to be cleaned, after which it is again lowered for boring. Drilling is the only method by which wells can be sunk where the strata are hard and the depth is considerable. For this purpose a so-called diamond drill is used, with which it is possible to penetrate any rock, no matter how hard. Drills of this kind are generally used in prospecting for coal, iron ore, petroleum, and precious metals.

WELLAND (wel'land), a river of Canada, in the Province of Ontario. It rises in southern Ontario and, after an easterly course of sixty miles, flows into the Niagara River a short distance above Niagara Falls. The Welland River is important for the reason that it is joined with the Welland Canal, thus forming a part of the system that passes around Niagara Falls and connects the navigation of Lake Ontario with that of Lake Erie. This canal is 15 feet deep, 160 feet wide, and 27 miles long. It has a total lift of 327 feet, which is possible by 25 locks. The town of Welland, capital of Welland County, is situated on the Welland Canal, near the Welland River, about twelve miles south of Saint Catharines. It is on the Grand Trunk, the Wabash, and the Michigan Central railroads. The place has a large trade in lumber and produce. It has manufactures of flour, machinery, and lumber products. Population, 1911, 5,318.

WELLES (welz), Gideon, statesman, born in Glastonbury, Conn., July 1, 1802; died in

Hartford, Conn., Feb. 11, 1878. After obtaining a general education, he studied law and in 1826 became editor of the Hartford Times, the chief organ of the Democratic party in Connecticut. He was a member of the Connecticut Legislature from 1827 to 1835 and served as State Comptroller for three years. While serving in the Legislature he secured the abolition of imprisonment for debt. President Polk appointed him chief of a bureau in the Navy Department, which position he filled from 1846 until 1849. When the Republican party was organized, Welles was one of its most ardent supporters. He served as Secretary of the Navy in the cabinets of Lincoln and Johnson, from 1861 to 1869. During a large part of the Civil War he maintained a coast blockade of about 2,000 miles, organized a fleet of ironclads and transports on the Mississippi River, and in various ways contributed to the naval victories of the North. He published "Memoirs of the War" and "Lincoln and Seward."

WELLESLEY (wělz'lī), a town in Norfolk County, Massachusetts, fifteen miles west of Boston, on the Boston and Albany Railroad. It is an attractive place, being well situated and improved by gardens, parks, and modern municipal facilities. The leading features include the Wellesley College, the Dana Hall, the Rockridge Hall, and the public library. It has systems of public waterworks and sanitary sewerage. Population, 1905, 6,189; in 1910, 5,413.

WELLESLEY, Richard Colley, Marquis of, statesman, born in Dublin, Ireland, June 20, 1760; died Sept. 26, 1842. He was the eldest son of the first Earl of Mornington, an Irish peer, and the eldest brother of the Duke of Wellington. After attending Eton College, he entered the University of Oxford, where he graduated in 1780, and on the death of his father, in 1781, became Earl of Mornington, taking his seat in the Irish House of Peers. He was elected to the British House of Commons, in 1784, and was soon after made Lord of the Treasury by Pitt. In 1797 he became a member of the House of Lords and the following year was made Governor General of India, where the French and Tippoo Sahib, a powerful prince, had formed an alliance against the British. His first success was the capture of a number of French officers, whom he sent to Europe, and afterward he invaded Mysore, capturing Seringapatam and slaying Tippoo Sahib in battle. It is due to the efficient services of Wellesley that England became the predominating influence in India. He founded the College of Fort William, built the palace of Calcutta, reformed the Indian civil service, and greatly extended the commercial and industrial enterprises.

Wellesley was sent to Spain as envoy in 1805, but Perceval made him Secretary of State for Foreign Affairs before the end of the same year. In 1821 he became Lord Lieutenant of Ireland, in which position he tried to reconcile the Protestants and Catholics, but by this policy he lost the support of the Orangemen. When his brother, Wellington, opposed the Catholic Emancipation, he resigned the Lord Lieutenancy. Earl Grey appointed him to the office a second time, in 1833, but the ministry fell soon after and Wellesley retired from official life. His "Memoirs and Correspondence" was edited by R. R. Pearce.

WELLESLEY COLLEGE, an institution for the higher education of women, founded at Wellesley, Mass., by Henry Fowle Durant. It was established "for the purpose of furnishing to young women who desire to obtain a liberal education such advantages and facilities as are enjoyed in institutions of a higher class." It was incorporated by the Legislature of Massachusetts in 1870, was opened for students in 1875, and the first degrees were conferred in 1879. Situated in the beautiful town of Wellesley, 15 miles from Boston, endowed with extensive grounds which are diversified by hill, meadow, and lake, the institution combines the advantages of free and healthful country living with those which come from proximity to a great literary, artistic, and social center. It has two large halls of instruction and residence, nine smaller dormitories, a chapel, an art building, a music hall, a chemistry laboratory, an observatory, and several society houses and other buildings. institution has no separate schools, but offers two courses, the undergraduate course leading to the degree of B. A. and the graduate course leading to the degree of M. A. It is affiliated with several institutions in Europe, including the zoölogical station at Naples and the American School of Classical Study at Athens and Rome. The faculty embraces 130 instructors and professors and the attendance is about 1,500 students. It has a library of more than 81,500 volumes.

WELLINGTON (wel'ling-tun), the capital of New Zealand, situated near the southern extremity of North Island, on Cook Strait. It has an excellent harbor and extensive steamboat and railway connections. The streets are spacious and well graded and paved. Among the chief buildings are the city hall, the customhouse and post office, the parliament building, the public library, Masonic Temple, and two fine cathedrals. It is the seat of Victoria College, which is affiliated with the University of New Zealand, and has several parks and botanical gardens. The manufactures include flour, leather, soap, boots and shoes, sailing vessels, vehicles, earthenware, preserved meat and fish, clothing, and machinery. It has a growing trade in cereals, coffee, live stock, and merchandise. The first settlement of New Zealand was made near Wellington in 1839. Population, 1911, 70,729.

WELLINGTON, Arthur Wellesley, Duke of, eminent military leader, born at Dangan

Castle, Ireland, May 1, 1769; died Sept. 14, 1852. He was a brother of Richard Colley Wellesley and the third son of the first Earl of Mornington. After studying at Eton and Brighton, he took a course in military science at Angers, France. In 1787 he entered the army as ensign and in 1793 secured the lieutenant colonelcy of the thirty-third regiment. His first service in actual military life was in 1794 and 1795, when General Pichegru drove the English army under the Duke of York out of Holland. He was sent to India in 1796 and arrived at Calcutta in the spring of 1797. In the following year his brother reached India as Governor General, and it was largely due to the successes of Wellington against Tippoo Sahib that the former succeeded in making India British. Failing health required him to return to Europe in 1805, where he was soon after appointed on an expedition into Hanover and Denmark,

He was elected to Parliament in 1806, when he also married Lady Catharine Pakenham, third daughter of the Earl of Longford, and in 1807 became chief secretary for Ireland. In 1808 he received the principal command of the peninsular army in Portugal, whence he was dispatched to expel the French, and defeated the latter under General Junot in the Battle of Vimeira. He won the Battle of Talavera on July 28, 1809, and soon followed it with a long list of victories, for which he was created a peer and became known as Viscount Wellington. Having been made commander in chief of the army in Spain, as he had previously been of the army in Portugal, he pursued the French with such vigor that Parliament raised him to the dignity of marquis and voted him \$500,000 for the purchase of an estate. In 1813 he won the Battle of Vittoria and was made field marshal, and the same year won battles in the Pyrenees, captured San Sebastian, and invaded France. He won the Battle of Orthez, in 1814, and followed it by defeating the French under General Soult at Toulouse, thus annihilating the opposing army in the peninsula. These successes caused Parliament to vote him thanks for the twelfth time and to present him with \$2,000,000. Napoleon having abdicated, the war closed, and Wellington became ambassador to France, but soon after succeeded Lord Castlereagh as representative in the Congress of Vienna.

Wellington was again put in command of the British forces when Napoleon escaped from Elba. In conjunction with Blücher, the Battle of Waterloo was won, on June 18, 1815, thus ending the military career of Napoleon. He was commander of the army that occupied Paris for several years, and, on returning to England, received a further gift of \$1,000,000. In 1819 he became a member of the Cabinet under Lord Liverpool, represented Great Britain in the Congress of Vienna in 1822, and was made high constable of the Tower in 1826. He superseded

3121

the Duke of York as chief commander of the forces, in 1827, and the following year became Premier of England. In that position he opposed the Catholic Emancipation and other reforms, thereby becoming so unpopular that his life was endangered by assaults from mobs. However, in 1829, as a means to avert a war with Ireland, he forced the Catholic Emancipation Act through Parliament. Later he was partially restored to popular favor by supporting the movement in favor of the repeal of the Corn Laws. In 1846 he retired from active public life. Wellington was buried under the dome of Saint Paul's Church, where a monument has been erected to his honor. Many biographies treating of his life have been published.

WELLINGTON, county seat of Sumner County, Kansas, 30 miles south of Wichita, on Slate Creek and on the Santa Fé and other railroads. It has railroad shops, flour mills, and grain elevators. The chief buildings include the courthouse, high school, Masonic Temple, and postoffice. It was settled in 1871 and incorporated in 1872. Population, 1910, 7,034.

WELLMAN, Walter, journalist and explorer, born at Mentor, Ohio, Nov. 3, 1858. He attended the common schools of his native State, founded the Cincinnati Evening Post in 1869, and in 1884 became correspondent for the Chicago Herald and other newspapers. He went to the Bahama Islands in 1892 and located the landing place of Columbus on Watling Island, marking the spot with a monument. In 1894 he conducted an expedition to the Arctic regions, reaching a point northeast of Spitzbergen. A second expedition to the Arctic region was undertaken by him in 1898, and the following year he discovered a number of new islands in the vicinity of Franz-Josef Land. He established an outpost near the eighty-first parallel, at Cape Heller, from which point he undertook to sail rapidly toward the north to reach the North Pole, but an accident near the eighty-second parallel compelled him to retreat. Besides corresponding for a number of newspapers, he published numerous articles in McClure's Magazine and the Century Magazine. He was one of the first to advocate the theory that the North Pole can be reached best by means of aërial navigation, and in 1905 published a number of articles giving advanced views upon this subject. Later, in 1908 and 1909, he undertook to sail to the North Pole in an airship, but the enterprise did not prove successful.

WELLS, David Ames, economist, born in Springfield, Mass., June 17, 1828; died Nov. 5, 1898. He is eminent as an advocate of free trade and as the author of many excellent treatises on financial and economical subjects. In 1867 he was commissioned by the United States government to visit Europe with the view of inspecting and reporting on competitive industries. He was made an associate of the

French Academy, in 1874, and was otherwise honored by numerous foreign societies and universities. His writings include "Science of Common Things," "Elements of Natural Philosophy," "First Principles of Geology," "Practical Economics," "Production and Distribution of Wealth," "Relation of the Tariff to Wages," "Our Merchant Marine," and "Principles of Taxation."

WELLSTON, a city of St. Louis County, Mo., near St. Louis, on the Wabash Railroad. It has a fine high school, city hall, and many churches. The place is popular as a residential center. It was settled in 1862. Pop., 1910, 7,312.

WELLSTON, (wělz'těn), a city of Ohio, in Jackson County, about 100 miles east of Cincinnati, on the Detroit Southern, the Baltimore and Ohio Southwestern, the Cincinnati, Hamilton and Dayton, and other railroads. Electric railways, street pavements, waterworks, and sanitary sewerage are among the improvements. It was settled in 1871 and incorporated in 1876. Population, 1900, 8,045; in 1910, 6,875.

WELLSVILLE, a city of Ohio, in Columbiana County, 38 miles north of Wheeling, W. Va. It is situated on the Ohio River, 48 miles below Pittsburg, and is on the Pennslyvania Railroad. Coal and fire clay are obtained in the vicinity. It has manufactures of brick, pottery, hardware, flour and grist, leather belting, and machinery. Electric lighting, waterworks, and sewerage are among the public utilities. It has a public library, a fine high school, and several well-built churches. Population, 1910, 7,769.

WELWITSCHIA (wĕl-wich'ī-à), a plant found in the desert regions of South Africa. It was so named from Friedrich Welwitsch (1806-1872), a German botanist. The plant is represented by a single species, which somewhat resembles a giant radish. The stem is not more than two or three feet high, but develops so as to be as much as twelve feet in circumference. Two long and leathery leaves spring from the main root, and these frequently become torn and dry, but no other leaves appear. However, short flower stocks spring from the base of these leaves from year to year. Botanists estimate that some of these plants subsist for more than a century.

WENER (va'ner), or Vener, the largest lake in Sweden, which is next in size to lakes Onega and Ladoga in Russia, hence it is the third lake of Europe. It is situated 150 miles southwest of Stockholm. The elevation above the sea is 150 feet and its greatest depth 310 feet. The lake is 90 miles long, is from 10 to 50 miles wide, and has an area of 2,010 square miles. It receives the overflow from several smaller lakes and the outlet into the Cattegat is by the Göta River. The lake has fine fisheries and in its vicinity are valuable forests. A canal connects it with Lake Wetter. It has canal connections with the Baltic Sea and the Cattegat.

WERDER (věr'der), August, general, born at Schlossberg, Germany, Sept. 12, 1808; died Sept. 12, 1887. He joined the army of Prussia in 1825. From 1842 until 1843 he engaged in the Russian campaigns in the Caucasus, after which he was raised to the rank of lieutenant general, and in the war of 1866 commanded a division against Austria, taking a prominent part in the Battle of Sadowa. He was a member of the staff of the Crown Prince at the beginning of the Franco-German War, in 1870, but soon received command of a corps. Later he conducted the siege of Strassburg, where he repulsed the French in several attacks. A large grant was given to him for valued service, together with the insignia of the order of the Black Eagle, and a statue was erected to his honor at Freiburg. He retired from the army in 1879.

WERNER (ver'ner), Reinhold von, admiral and writer, born at Weferlingen, Germany, May 10, 1825. He was trained for service in the national navy and in 1849 became an officer in the reorganized fleet of the German nation. He joined the navy of Prussia in 1852, commanded in the war against Denmark in 1864, and during the Seven Weeks' War rendered efficient service on the North Sea by seizing the ports of Hanover, which had been greatly strengthened by the allies of Austria. In 1875 he was made rear admiral and was ennobled in 1901. For some years he published the Hansa at Hamburg, a magazine devoted to seamanship. His books include "Recollections and Pictures of Sea-life," "The Prussian Expedition to China, Japan, and Siam," "Three Months on the Slave Coast," "History of German Naval Wars from Germanicus to William II.," and "The Practical School of Sea-life." He died Mar. 15, 1909.

WERWOLF (wer'wulf), or Werewolf, a man who was supposed to be able to convert himself into a wolf. It was an old superstition of many countries, especially among Germanic and Scandinavian peoples, that such persons existed. A werwolf, while in the form of a wolf, was supposed to possess all the powers and appetites of that animal. He was thought to be particularly fond of human flesh, hence he was much dreaded by the ignorant and superstitious. The belief in beings of this kind spread to Ireland, where it was thought that men existed who were not of one skin. Later the belief in werwolves was carried to France. In the latter country it was supposed that these beings carried off children.

WESER (vå'zēr), a river of Germany, which is formed by the Fulda and Werra rivers a short distance southwest of the Hartz Mountains, and, after a course of 260 miles toward the northwest, flows into the North Sea. A canal connects it with the Elbe. Bremen and Bremerhaven are the chief cities on its banks. The tributaries include the Aller and Hunte.

WESLEY (wes'li), Charles, clergyman, born

in Epworth, England, Dec. 18, 1708; died March 29, 1788. He was a brother of John Wesley and was educated at Westminster School and Oxford University. From 1735 to 1736 he was with his brother John in Georgia, where he served as secretary to Governor Oglethorpe. He returned to England in the latter year and greatly assisted his brother in evangelistic work and in establishing the Methodist faith. Though not gifted with the personal magnetism and oratorial power of his brother, he rendered valuable service to the movement in writing numerous beautiful hymns. Many of his songs rank among the best and most admired in the English language. They include the immortal hymn, "O, for a Thousand Tongues to Sing!" The total number of hymns written by him is given at 6,100, of which about 2,000 were left in manuscript. He published "Sermons with Memoir."

WESLEY, John, famous clergyman and founder of Wesleyan Methodism, born in Epworth, England, June 17, 1703; died in London, March 2, 1791. His father, Samuel Wesley (1690-1739), was a clergyman at Epworth and a distant relative of Arthur Wellesley, Duke of Wellington. He entered Charter House school in 1714 and in 1724 graduated from Oxford University. In 1726 he was made a fellow at Lincoln College, Oxford, became a pastor in 1728, and in 1735 joined the colonists in Georgia as a preacher and missionary. After spending two years with the colonists and on missionary work to the Indians, he returned to England, where he became interested in studying the doctrine of the Moravians. He had been impressed with the views of the Moravians while on his journey to America, but in 1738 visited Herrnhut, the Moravian settlement in Germany, and became greatly interested in their doctrines. While there he was influenced in several matters of faith by Zinzendorf. His brother, Charles Wesley, soon joined him in the work that led to the founding of the Wesleyan Methodist faith, the name Methodism being derived from the strict and methodical habits of his sympathizers.

Wesley began holding open air meetings in 1739, in which he was associated with Whitefield, and not infrequently delivered 800 sermons per year. Thousands of earnest listeners attended his meetings, which were always made interesting by fine singing and an earnest and able exposition of Bible truths. Few laborers in the Christian cause have exceeded Wesley as incessant workers. It was not uncommon for him to travel thirty to sixty miles in a day, deliver two or three sermons, and write and read while making the journey. His success in arousing thought may be attributed to his unrivaled personal magnetism, powerful oratory, and methodical plans and perseverance in carrying forward his work. In 1750 he married Mrs. Vizelle, a widow with four children, but the union did not prove a happy one and separation finally fol-

lowed. He wrote many works on religious themes, published a number of original hymns, and translated several songs from the German. Though the founder of a distinct faith, he never formally separated from the Church of England. His chief writings include "A Calm Address to Our American Colonies," "Notes on the Old and New Testaments," "The Doctrine of Original Sin," "Survey of the Wisdom of God in Creation," and "Preservative against Unsettled Notions in Religion."

WESLEYAN UNIVERSITY, an institution of higher learning at Middletown, Conn., established under the patronage of the Methodist Episcopal Church in 1829. A class of six students graduated from the institution in 1833, and it takes rank as the pioneer college of that denomination in America. The courses include classics, sciences, theology, philosophy, and literature. Though coeducational, the number of women admitted in any year is limited to twenty per cent. of the enrollment for the preceding year. The value of the property is placed at \$2,500,000. It has a library of 65,000 volumes, a faculty of 40 instructors, and an attendance of 450 students.

WEST, Benjamin, painter, born in Springfield, Pa., Oct. 10, 1738; died in London, England, March 11, 1820. He descended from a family of Quakers. His first painting was a portrait of a baby sister lying in the cradle, which he executed when only seven years old, using colors made from berries and a brush of hairs taken from a cat's tail. In 1756 he established himself as a portrait painter in Philadelphia, but soon after removed to New York, where he attained considerable success. went to Italy in 1760 to study art, and in 1763 settled in London as a portrait and historical painter. There he was liberally patronized by many famous men, including George III., who made him his historical painter. He joined three other painters in 1768 in founding the Royal Academy, of which he became president in 1792, an office held by him for 28 years. Most of his paintings are historical, but he painted many scenes based on the Scripture and a large number of portraits. The entire productions somewhat exceed 400. He painted "Christ Healing the Sick" when 65 years of age, which was purchased by the British Institution for \$15,000. Other paintings of note include "The Return of the Prodigal Son," "Hector and Andromache," "The Death of General Wolfe," "The Battle of La Hogue," "Death on the Pale Horse," "The Crucifixion," "Agrippina," and "Installation of the Order of the Garder."

WEST BAY CITY, formerly a city of Michigan, in Bay County, five miles south of Saginaw Bay, on the Detroit and Mackinac, the Grand Trunk, and the Michigan Central railroads. It is finely situated at the mouth of the Saginaw River. Across the river is Bay City,

to which it was annexed in 1905. The features include the public library, the high school, and many large business blocks. Among the manufactures are ironware, furniture, machinery, clothing, salt, lumber products, and sailing vessels. The city is lighted by gas and electricity, has an extensive system of street railways, and is the center of a large interior and lake trade. It has public waterworks, street pavements, and sewerage. Population, 1914, 12,997.

WESTBORO (west'bur-o), a town of Massachusetts, in Worcester County, 12 miles east of Worcester, on the Boston and Albany Railroad. It has a number of fine public schools, the Lyman Reform School, a public library, and a hospital for the insane. The manufactures include automobiles, clothing, machinery, boots and shoes, earthenware, and rubber goods. It has electric lighting and municipally owned waterworks. The first settlement in its vicinity was made in 1659, when it became known as Chauncy, and was incorporated as a town in

1717. Population, 1905, 5,378; in 1910, 5,446. WESTBROOK (west'brook), a city of Maine, in Cumberland County, at the junction of the Stroudwater and Presumpscot rivers, six miles northwest of Portland. It is on the Maine Central and the Boston and Maine railroads. Among the noteworthy buildings are the public high school, several parochial schools, a number of fine churches, and the Walker Memorial Library. The chief manufactures are silk and woolen textiles, paper, clothing, and machinery. It has waterworks, street pavements, and electric railroad connections with Portland. The trade is largely in cereals, manufactures, and merchandise. It was incorporated as a town in 1814 and became a city in 1891. Population, 1900, 7,283; in 1910, 8,281.

WEST CHESTER (ches'ter), a city in Pennsylvania, county seat of Chester County, 27 miles west of Philadelphia, on the Pennsylvania and the Baltimore and Washington railroads. It is surrounded by a fertile farming and dairying region. The noteworthy buildings include the county courthouse, the public library, the Chester County Hospital, the Friends' School, the Turk's Head Hotel, the Darlington Seminary, and the West Chester State Normal School. Marshall Square contains a botanical collection. The manufactures embrace flour, hosiery, machinery, soap, hardware and farming implements. It was founded in 1784 and chartered as a borough in 1799. Population, 1910, 11,767.

WESTERLY (west'er-li), a town of Rhode Island, in Washington County, on the Pawcatuck River, five miles north of Long Island Sound. It is on the New York, New Haven and Hartford Railroad. In the surrounding country are extensive quarries, which produce the wellknown Westerly granite. Among the features are the fine public library, the high school, many large churches, and the Soldiers' Memorial

building. It has manufactures of flour, cotton and woolen goods, carriages, medicines, clothing, and machinery. The public utilities include electric street railways, waterworks, and sanitary sewerage. Although it was first known as Misquamicutt, it was incorporated as Westerly in 1669. Population, 1905, 8,381; in 1910, 8,696.

WESTERN AUSTRALIA, the largest State of the Commonwealth of Australia, comprising the entire western third of the continent. It is bounded on the north, west, and south by the Indian Ocean and the eastern boundary is formed by South Australia. The length from north to south is about 1,450 miles, the breadth is 950 miles, and the area is 975,920 square miles.

DESCRIPTION. The surface is of an undulating character, but the general elevation is not high above the sea. Much of the surface consists of sand or sandstone plateaus. Fertile regions lie along the coast and in the southwest, where vegetation is extensive, and the interior is occupied largely by the Victoria Desert. Several mountain ranges diversify the surface, including the Victoria, Darling, and Herschel ranges, but their heights do not exceed from 2,500 to 3,825 feet. The Kimberley District, in the northern part, consists of elevated plains through which deep ravines have been cut by the action of streams. As a whole the coast is quite regular, with small indentations, such as Shark's Bay, Exmouth Gulf, and King Sound. Many small islands lie off the coast.

The drainage is chiefly toward the west, and all of the southern part is without a river. Rainfall in the interior is so scant that it does not exceed the natural evaporation, hence the water sinks into the ground or is carried by short streams into lakes that have no outlet. Among the chief rivers flowing west are the Fitzroy, the DeGrey, the Ashburton, the Gascoyne, and the Murchison. Many salt lakes are located in the west central part, but none of them has an outlet to the sea. These include Austin, Carey, Barlee, Moore, and Monger lakes. Sterile tracts of sandy wastes and numerous salt marshes abound in the region of the lakes, but many sections contain good grazing lands. Most of the lakes become mud flats during the dry season, when they are covered with beds of salt.

The climate in general is very dry, but it is healthful and quite pleasant. Slight frosts occur in winter. The summer heat is usually from 70° to 90°, though the thermometer may rise to 112°. Rainfall is from six to ten inches in the interior, but along the coast it ranges from fifteen to forty inches. A scarcity of precipitation renders it almost impossible to secure wells in many parts of the interior, thus necessitating the construction of cisterns to preserve water for the dry season, or the movement of stock toward the coastal districts. Fine forests abound in the southwestern section, where many trees

attain an enormous size, such as the sandalwood, karri, tuart, and eucalyptus. Other trees include the baobab, red gum, pepper bark, mangrove, and grass trees.

Mining. The State is rich in mineral deposits. Gold has been mined in the Kimberley District since 1882 and in the Yilgarn District since 1887, and the output of this mineral is now greater than in any other subdivision of the continent. At present the production of gold is about half of the total output obtained in the continent. Clays suitable for brick and pottery are abundant, and granite, limestone, and sandstone are widely distributed. Other minerals include silver, lead, zinc, tin, iron, copper, salt and plumbago. The prospects for development in mining are very great.

AGRICULTURE. The arable portion of Western Australia is better adapted to agriculture and stock raising than any other part of the continent, this being due to the fact that rainfall is certain. However, progress in these enterprises has been made only along the southwestern coast, since the vast interior does not have sufficient moisture to mature the crops. Farming has developed materially since the mining interests have extended. Wheat is the leading cereal and both wheat and oats are cut to some extent for hay. Other products include tobacco, barley, sugar beets, rye, vegetables, and fruits. Large areas are suitable for grazing, but the pastoral industry is seriously limited on account of the difficulty in obtaining water. Sheep are grown more extensively than any other class of domestic animals, but the interests in cattle and horses are large. Camels are reared for use as beasts of draft and burden. The culture of silk and the mulberry tree has been introduced successfully.

TRANSPORTATION. None of the rivers is navigable and few harbors are afforded by the coast. Railroad building has been confined chiefly to the southwestern part, with Perth as the leading railway center. The lines of railways in operation include a total of 3,475 miles, the larger part of which is owned and operated by the government. Highways have been built and are maintained in the more generally settled portions. Telephones are in general use and the telegraph lines include a total of 14,500 miles. The exports include minerals, pearls, timber, wool, cured and canned fish, cereals, live stock, and hides. Among the leading imports are clothing, tea, chemicals, spirits, and machinery.

Manufactures. The manufacturing enterprises are connected largely with the mines and lumber industries. Flour and grist are produced extensively and considerable interests are vested in canning fruits and fish and in tanning hides. Extensive machine shops are located at Perth, but these are devoted chiefly to the manufacture of implements and in reconstructing and repairing in connection with railway trans-

portation. Among the general manufactures are clothing, pottery, canned fruit and fish, cigars, furniture, and clothing.

GOVERNMENT. The Governor is appointed by the British crown, and he exercises general executive power through a responsible minister. Legislative authority is vested in a Parliament of two branches, the legislative council of thirty members and the legislative assembly of fifty members. Representatives in both departments are elected by popular vote without distinction of sex, the councilors for six years and the assemblymen for three years. The right of suffrage is based upon a property qualification. Local government is administered by counties, municipalities, and towns.

EDUCATION. Public schools are maintained in all the settled portions, at which attendance is free, but compulsory between the ages of six and fourteen. Instruction in the public schools is secular, but religious training may be given by clergymen of the same denomination as the parents of the children. Numerous secondary schools are maintained in the larger towns. Perth is the seat of the university. A number of parochial schools and educational associations of various kinds are in a flourishing condition.

INHABITANTS. The State is one of the most sparsely settled regions in the world. Nearly all the settlements are confined to the coast and in the mining districts. The larger number of inhabitants are British or of British descent, and the Anglican Church has a larger membership than any other. Among the leading denominations, besides the Anglicans, are the Roman Catholics, Methodists, and Presbyterians. Perth, in the southwestern part, is the capital and largest city. Other cities include Fremantle, Kalgoorile, Boulder, Coolgardie, and York. In 1910 the State had a population of 288,483.

HISTORY. The western coast of Australia was first visited by the Portugese in the 16th century. Dutch explorers surveyed the northern coast about a century later. In 1825, the first settlement was established within the present confines of Western Australia by the English, who took official possession of the region two years later. Large grants of land were made to companies in 1829, with the view of colonizing the country, and several thousand convicts from Sydney came with the early settlers. The discovery of gold, in 1882, brought a large number of prospectors to the Kimberley District, and after 1890 the immigration became extensive. Western Australia long opposed the formation of the Commonwealth of Australia, but it finally agreed to that project in 1900. The extensive development of mining and agriculture are contributing to the rapid growth in wealth and population.

WESTERN RESERVE UNIVERSITY, an institution of higher learning at Cleveland, Ohio, founded at Hudson in 1826 as the West-

ern Reserve College. It was removed to Cleveland in 1882 and renamed Adelbert College. The College for Women was established in 1888. Four years later, in 1892, the Department of Graduate Instruction was founded by the faculties of Adelbert College and the College for Women. Adelbert College and the College for Women are located on Euclid Avenue, adjacent to Wade Park and the boulevard system. The Medical College, founded in 1843, is the third oldest institution of its class west of the Alleghenies. Other departments include the Law School, opened in 1892, the Library School, founded in 1894, and the Dental Department, which is located down-town. At present the total enrollment averages about 2,200 and the faculty consists of 313 instructors and officers. The libraries of the university contain about 95.-000 volumes. It has endowments valued at \$1,500,000, an income of \$300,000, and property valued at \$2,850,000.

WESTFIELD (west'feld), a town of Massachusetts, in Hampden County, on the Westfield River, ten miles west of Springfield. Communication is furnished by the Boston and Albany and the New York, New Haven and Hartford railroads. It is surrounded by a fertile farming and dairying region. Among the notable buildings are the Noble Hospital, the Westfield Athenaeum, and the State Normal School. It has electric street railways, pavements, waterworks, and several libraries. The manufactures include cigars, baskets, paper, whips, textile fabrics, thread, and machinery. It has a growing trade in farm produce and merchandise. Westfield was settled in 1642 and incorporated in 1669. Population, 1905, 13,611; in 1910, 16,044.

WESTFIELD, a village of New Jersey, in Union County, seven miles west of Elizabeth, on the Central of New Jersey Railroad. The manufactures include clothing, utensils, and machinery. Electric lighting, waterworks, and macadamized streets are among the improvements. Population, 1910, 6,420.

WEST HAMMOND, a city of Cook County, Ill., 20 miles south of Chicago, on the Pennsylvania and other railroads. It has extensive manufactures of glue, grain products, and machinery. The chief buildings include the high school and several churches. Pop., 1910, 4,948.

WEST HAVEN, a borough of Connecticut, in New Haven County, separated from New Haven by the West River. It is on the New York, Hartford and New Haven Railroad and is popular as a residential center. The place was a part of New Haven until 1822, when it was united with North Milford. Population, 1910, 8,543.

WEST HOBOKEN (hō'bō-ken), a town of New Jersey, in Hudson County, near Hoboken and two miles west of New York City. It has railroad and electric railway facilities. The features include the public library, the high school, the Monastery of the Passionist Fathers, the Masonic Temple, the Catholic theological seminary, and the Convent of the Sisters of Dominic. It has manufactures of clothing, silk textiles, furniture, gloves, and machinery. Large quantities of flowers are cultivated in the vicinity. It was a part of Bergen until 1861, when it was incorporated under the present name. Population, 1905, 29,082; in 1910, 35,403.

WEST INDIES (in'dez), or Antilles (äntil'lez), an island archipelago of America, extending from the extremity of Florida to the northern coast of Venezuela. It lies between the Gulf of Mexico and the Caribbean Sea on the west and the Atlantic Ocean on the east.

575 square miles, and of this land surface about 82,575 square miles are included in the Greater Antilles.

The West Indies are largely of volcanic origin, probably embracing the summits of a submerged mountain system, but the Bahamas and a number of individual islands are of coral formation. The latter are generally low and level, but those of volcanic origin have peaks towering from 5,000 to 8,550 feet above sea level. Marked differences prevail in the climatic conditions of the islands, largely because of much diversity in elevation and in their situation in latitude. Those having an elevated surface are generally favorable to Europeans, while those lying near

sea level are excessively hot in the summer season. Hurricanes and storms are quite frequent. Insects, reptiles and birds are well represented by many species. The group as a whole has considerable mineral wealth in gold, silver, lead, coal, iron, copper, tin, manganese, limestone, and granite. Among the chief productions are tobacco, cotton, sugar, rum, coffee, maize, potatoes, yams, pineapples, lemons, oranges, citron, pomegranates, manioc, indigo, pepper, aloes, sassafras, and other tropical products. Horses, cattle, sheep,

Costa RIC Mosquite Cost A RIC RAGIO Mosquite Cost A RIC Mosquite C

About 1,000 islands are included in the group, ranging from small islets to Cuba, which is the largest of the islands. The archipelago may be divided into four groups: the Greater Antilles, the Lesser Antilles, the Bahama Islands, and the Virgin Islands. Since these groups and a number of the more important islands are described in special articles, it is intended in this article to call attention to only a few general characteristics.

The Greater Antilles comprise the four largest islands of the West Indies, including Jamaica, Porto Rico, Hayti, and Cuba. The Lesser Antilles lie between the northeastern part of Venezuela and Porto Rico, forming an extensive chain of islands and islets. On the other hand, the Virgin Islands form a connecting link between the Greater and Lesser Antilles, lying northeast of Porto Rico, and the Bahama Islands are southeast of Florida. These islands lie within the Torrid Zone, except the Bahama group, which is situated mostly north of the Tropic of Cancer. The area is estimated at 98,-

swine, mules, and poultry are grown in abundance. The islands yield large quantities of valuable timber.

Columbus first saw land in America by discovering San Salvador, an island of the West The archipelago was so named by a company of Dutch traders, who also had interests in the East Indies. Carib and Arawak Indians inhabited the islands at the time of the discovery, but they were enslaved by the Spaniards and were largely exterminated. Slave labor being highly profitable in the sugar and tobacco plantations, many Africans were imported by English and other slave traders. The present inhabitants descended largely from the early natives, Africans, and Spaniards, but now many Americans and Europeans are found on the different islands. Spain gradually lost influence in the archipelago, owing to wars with the French, English, and natives, and in 1898 the last possessions were surrendered as a result of the Spanish-American War. Porto Rico belongs to the United States; Cuba and Hayti are

		*



WESTMINSTER ABBEY

Westminster Abbey, founded in the 7th century and rebuilt by Edward the Confessor (1040-05), dates in its present form from the 13th century. For hundreds of years it has been the burial place of England's greatest dead, kings, peers, or commoners. The Poet-Corner records the most famous names in English literature.

independent republics; and Jamaica, Trinidad, and several smaller islands belong to Great Britain. The United States, France, Netherlands, and Venezuela have possessions in these islands. See Danish West Indies.

WESTINGHOUSE (wes'ting-hous), George, inventor and manufacturer, born at Central Bridge, N. Y., Oct. 6, 1846; died Mar. 12, 1914. He studied at Schenectady, where his father was a large manufacturer of agricultural machinery, and soon demonstrated inventive and mechanical genius in his father's machine shop. In 1865 he invented a railway frog for replacing cars on the track and other railway appliances. His greatest achievement was the invention of the famous Westinghouse air brake (q. v.), which he afterward greatly improved, and it is now used very extensively. He is the inventor of several steam and gas engines, steam turbines, and safety devices useful in railroading. Subsequently he became interested in electricity and acquired patents on electrical alternating current machinery, by which it became possible to develop the use of water power for long distances, and which led to the establishment of the great generators at Niagara Falls and those for elevated railroads in New York and Chicago. He established workshops for the manufacture of air brakes and electrical and steam machinery in France, Germany, and Great Britain. The company founded by him is capitalized at \$75,000,000 and gives employment to 20,000 people. Many governments and numerous scientific societies bestowed honors upon him, among others the Order of Leopold of Belgium, the Royal Crown of Italy, and the Legion of Honor of France. In 1905 he was elected one of the trustees of the Equitable Life Insurance Society of the United States.

WESTMINSTER ABBEY (west'min-ster ăb'by), the famous church in Westminster, which was formerly a distinct city of Middlesex, England. It is now united with London, though separate local jurisdictions are maintained. Westminster Abbey is one of the chief ornaments of London and is famous as the coronation place of the English sovereigns. The first building to be erected on its site was a church built in the 7th century under Sebert, King of the East Saxons, but subsequently an abbey took its place, which was named Westminster to distinguish it from Saint Paul's, or Eastminster. In 1065 the first stone church was erected here by Edward the Confessor and a part of it still remains, the preserved portion being known as the Pyx-House. The main structure dates from 1220, when Henry III. built the choir and transepts, but the principal building was not completed until in the reign of Edward I. Richard III. added the west front. About the same time were built the nave and aisles and the Jerusalem chamber, while Henry VII. erected the chapel which bears his name. Sir Christopher Wren designed the upper parts of the two western towers.

The Church of Westminster is 531 feet long, its roof is 212 feet high, and its towers are 225 feet above the foundation. It has been the place of coronation since the time of Edward I., who brought from Scotland the coronation stone on which the kings of Scotland had been crowned. All the English kings from Edward the Confessor to George II. were buried at Westminster Abbey. In the Poet's Corner, on the east aisle of the south transept, are memorials to all the most eminent English writers from Chaucer down. Among the excellent monuments are those erected to Canning, Pitt, Chatham, Fox, Watt, Stephenson, and other famous statesmen and inventors. The Westminster School is a famous institution of Westminster and is one of the seven noted public schools of England. It was founded in 1560. Among the eminent masters and pupils of this institution are Jonson, Cowper, Dryden, Halifax, Wren, Hastings, and

WESTMINSTER HALL, the large hall of the former palace of Westminster, now used as a vestibule to the British Houses of Parliament, in London. It was erected during the reign of Richard II., about 1398, when it succeeded a number of government buildings that had been destroyed by fire. As the structure now stands, it is 68 feet wide, 90 feet high, and 290 feet long. The roof is made of carved timber and the structure is ornamented by a fine porch. In historical associations it may be said to be the foremost hall of England. It is the place where Richard II. was deposed, Charles I. received his death sentence, and the trials of Warren Hastings, Chancellor More, and Lady Jane Grey were held. Here Cromwell was installed as Protector. The hall served for great public festivals during the coronation ceremonies and when the lord mayor of London was sworn into

WEST NEW YORK, a town of New Jersey, in Hudson County, situated near West Hoboken, with which it is connected by electric railways. The industries consist chiefly of silk manufactures, machine shops, and cotton and woolen mills. It has an extensive system of waterworks, systems of electric and gas lighting, and a large trade in merchandise and manufactures. Population, 1910, 13,560.

WEST ORANGE (ŏr'ĕnj), a town of New Jersey, in Essex County, twelve miles west of New York City. It is on the Zrie and the Delaware, Lackawanna and Western railways. The town occupies a fine site along the slope of Orange Mountain. A fine view of New York City is afforded by Eagle Rock, an elevation of 600 feet. The streets are well paved and lighted. Llewellyn Park, a fine public resort, contains 750 acres. The manufactures include carriages, clothing, furniture, and electrical appliances.

West Orange is popular as a residential center. Population, 1905, 7,872; in 1910, 10,980.

WESTPHALIA (wěst-fa'lī-à), a province of Germany, in the western part of Prussia, lying south of Hanover and east of the Nether-The length from east to west is 125 miles; width, 108 miles; and area, 7,810 square miles. The northwestern part has a level surface, while the southern part is largely of an undulating character, being formed of hills and valleys. Most of the province is highly fertile, especially the western part, which resembles the eastern portion of the Netherlands. It has extensive mineral deposits, especially coal and iron. Other minerals include sulphur, copper, salt, petroleum, zinc, limestone, and sandstone. Manufacturing enterprises have been developed to a high degree of perfection, especially those devoted to the production of furniture, iron and steel, linen and woolen goods, chemicals, silk fabrics, machinery, pottery, and clothing. Westphalia is noted for its agricultural wealth, particularly for its yield of wheat, rye, flax, hemp, vegetables, and fruits. Hogs, cattle, horses, goats, and poultry comprise the domestic animals, yielding dairy products, cured meats, and hides

Westphalia has a large number of railroads, but likewise has transportation by the Lippe and Ems rivers and by several canals. The inhabitants are descendants from the Saxons, who settled here from the vicinity of the Elbe shortly after the beginning of the Christian era. Charlemagne added the region to his dominion, but shortly after his death it became subject to the dukes of Lower Saxony. In 1179 it was made a part of the German Empire and until 1802 belonged to the Cologne electorate, when it came under the government of the Hesse-Darmstadt family. Napoleon organized the kingdom of Westphalia, which included the present West-phalia and several adjacent states, and placed his brother, Jérôme, on the throne. The kingdom was abolished after the Battle of Leipsic and the Treaty of Vienna incorporated the region with Prussia. The Thirty Years' War was ended in 1648 by the Treaty of Westphalia, which was concluded at Münster and Onsabruck. Münster is the capital. Population, 1915, 3,618,090.

WEST PITTSTON (pits'tun), a borough of Pennsylvania, in Luzerne County, on the Susquehanna River, opposite Pittston. It has electric railway facilities with Pittston and other points and contains many fine private and business buildings. The manufactures include machinery, cigars, and clothing. Many Pittston business men have their homes in the borough. Population, 1900, 5,846; in 1910, 6,848.

WEST POINT, a village of New York, in Cornwall township, Orange County, on the Hudson River, 52 miles north of New York City. It has regular communication by steamboats and by the West Shore and the New York Central

railroads. The place occupies an attractive site on the west bank of the river, affording a fine view of the river and the adjacent hills, which tower from 475 to 1,500 feet above sea level. West Point is celebrated on account of being the seat of the United States Military Academy. At the time of the Revolution it was fortified under an act of Congress. This body authorized a corps of engineers and artillerists to permanently garrison the forts and in addition provided for the instruction of 32 students. In 1798 the corps was enlarged, and the number of instructors and cadets to be maintained was likewise extended. With the growth of the military importance of the United States there has been a constant enlargement of the institution, and the course of study has been extended from time to time to meet the demands of consecutive development.

The reservation occupied by the military post comprises 2,300 acres. Although the place was an important strategic point at the time of the Revolution, the government did not acquire title to the land until in 1790. Kosciusko, the Polish soldier, was retained as the engineer and the place was fortified under his direction. It was commanded by Benedict Arnold in 1780, who conspired to betray his trust to the British, but the scheme was averted by the arrest of Major André. Congress made the place the seat of the United States Military Academy in 1802. See United States Military Academy.

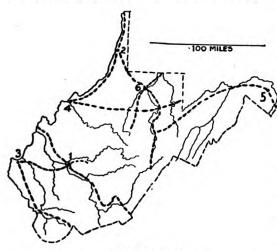
WEST SPRINGFIELD, a town of Massachusetts, in Hampden County, on the Boston and Albany Railway. It is situated on the Connecticut River, opposite Springfield, and is popular as a residential center. The chief buildings include the public library with 8,500 volumes, several fine public and secondary schools, and a number of churches. Among the manufactures are clothing, machinery, and hardware. It has extensive railway repair shops, waterworks, and electric lighting. The first settlement was made in the vicinity about 1655 and it was incorporated as a town in 1774. Popula-

tion, 1905, 8,101; in 1910, 9,224. WEST VIRGINIA (ver-jin'i-a), a Middle Atlantic State of the United States, popularly called the Pan Handle State. It was bounded on the north by Ohio, Pennsylvania, and Maryland; east by Pennsylvania, Maryland, and Virginia; south by Virginia and Kentucky; and west by Kentucky and Ohio. The boundaries are quite irregular, being formed on the southeast by the Allegheny Mountains, on the southwest by the Big Sandy River, on the northwest by the Ohio, and on the northeast by the Potomac. A narrow strip of land, called the Pan Handle, extends northward between Ohio and Pennsylvania. The greatest extent from southwest to northeast is 210 miles and the distance across the State from east to west is 125 miles. The area is 24,780 square miles.

DESCRIPTION. The general surface of the State

is hilly, while the eastern part is mountainous, where it is traversed by the Greenbrier Mountains and other ranges of the Appalachian system. These highlands occupy about one-third of the surface and in the southern part merge into the Cumberland Plateau. The mountains have the form of parallel ridges which trend from the northeast toward the southwest, but in the southern part merge into a generally hilly section. Spruce Knob, the highest point in the State, has an altitude of 4,860 feet. Along the Ohio River the altitude is about 550 feet and farther east, midway in the State, the general altitude is 2,000 feet.

The drainage of the larger part of the State belongs to the Ohio basin, but a small section in the northeast is tributary to the Potomac, which separates the State from Maryland. Several streams flow into the Potomac, including



WEST VIRGINIA.

1, Charleston; 2, Wheeling; 3, Huntington; 4, Parkersburg; 5, Martinsburg; 6, Fairmont. Principal railroads shown by dotted lines.

the South Branch, which is the largest headstream. The Big Sandy separates the State from Kentucky and has a course toward the northwest into the Ohio. Other streams that are tributary to the Ohio include the Monongahela, the Little Kanawha, the Great Kanawha, the Greenbrier, and the Guyandotte. The Ohio is important for navigation and many of the streams within the State furnish abundant water power.

The climate is quite equitable and has no great extremes of heat and cold. All parts of the State have an abundance of rainfall for the maturity of crops. In the northeast the rainfall is 22 inches and in the south it is about 45 inches. The extremes of temperature are 10° below zero in winter and a summer heat of 98°. Considerable snow falls in all parts of the State, but it does not lie long upon the ground in the south. Fine forests of walnut, oak, poplar, chestnut,

butternut, ash, cherry, locust, and hemlock abound.

MINING. The mineral sources are both varied and extensive. In the output of coal it is exceeded only by Pennsylvania, and the yield per year is placed at 48,750,000 tons. A large share of the coal mined is anthracite, and the bituminous coal obtained is of a high quality. It has a large output of natural gas and petroleum, both of which are conveyed by pipe lines to considerable distances. These minerals are found in many sections, in fact the coal measures underlie a large part of the State, and many of the veins have a thickness of four to six feet. Clavs and building stone are obtained in large quantities for manufacturing and construction purposes. Other minerals include salt, iron, bromine, copper, alum, and sulphur.

AGRICULTURE. The average size of farms is 114 acres and fully three-fourths are worked by their owners. Farming is especially profitable in the western part of the State, where the soil is highly fertile, while the eastern section is well adapted to grazing. is the leading cereal, but is followed closely by the interests vested in the growing of hay and wheat. Farming as a whole is conducted on a modern basis, and considerable commercial fertilizers and the rotation of crops are employed to maintain fertility. Oats, buckwheat, potatoes, rye, tobacco, sorghum cane, and dry beans are grown profitably. Fruits are produced in large quantities, especially apples, quinces, peaches, pears, grapes, plums, and small fruits. Large interests are vested in raising cattle for meat and dairying. Other domestic animals include horses, sheep, swine, mules, goats, and poultry.

MANUFACTURES. The extensive fields of coal, petroleum, and natural gas give an immense impetus to the manufacturing enterprises, especially in the production of iron and steel, coke, and lumber products. Iron and steel rank as the most important products, and the enterprises concerned in commodities made of these metals are centered largely in the vicinity of Wheeling. Next of importance are the lumber and timber products. Other important manufactures include leather, flour and grist, railway cars, pottery, brick and tile, glass, and machinery. The State takes high rank in the production of butter and cheese, in the output of cigars and smoking tobacco, and in the canning of fruits and vegetables.

Transportation. The Ohio is the most important navigable highway, but steamboat facilities are provided by the Big Sandy and the Great Kanawha. Development in railroad building has brought most sections of the State in close touch with trade centers. The three trunk lines that cross the State are the Baltimore and Ohio, the Norfolk and Western, and the Chesapeake and Ohio. A total of 3,750 miles of railways are in operation. Considerable traffic is

carried by electric railway lines. Much has been done to provide suitable highways and maintain them by local authorities.

GOVERNMENT. Executive authority is vested in the governor, secretary of State, auditor, treasurer, attorney general, and superintendent of free schools, all elected for terms of four years. In case of vacancy in the office of Governor, the president of the senate and the speaker of the house are in the line of succession to that office. Legislative authority is exercised by the General Assembly, which consists of the senate of 24 members and the house of delegates of 65 members. Senators are elected for four years, while the delegates are elected for two years. Four judges elected for terms of twelve years constitute the superior court, the highest judicial tribunal. In addition there are circuit courts, courts of limited jurisdiction, courts of county commissioners, and justices of the peace. Local government is administered by the counties, towns, and municipalities.

EDUCATION. The State maintains separate schools for white and colored pupils. A part of the revenues is obtained from the income on a permanent school fund, but the larger portion is derived from a system of general taxation. Based upon the total population of ten years of age and upward, the illiteracy is 11.4 per cent., but it is much larger among the colored than among the white inhabitants. A commission was appointed in 1906 to revise the school laws. The commission reported in 1908, when many improvements were made in the system of common schools, as well as in the high school education, and many of the district schools were consolidated. The average length of the school term is about 140 days. Normal schools for the training of teachers are maintained at Athens, Fairmont, Glenville, Huntington, Shepherdstown, and West Liberty. Additional normal training is provided in the West Virginia Colored Institute, at Institute.

The University of West Virginia, at Morgantown, is at the head of public instruction. Other institutions of higher learning include the Bethany College, at Bethany; the Barboursville College, Barboursville; and the West Virginia College, Flemington. The State prison is at Moundsville, hospitals for the insane are located at Spencer and Weston, and an institution for the deaf, dumb, and blind is at Romley. Pruntytown has a reform school for boys and Salem has a reform school for girls. An asylum for incurables is maintained by the State at Huntington. The labor of the convicts is utilized in supporting the State penitentiary.

INHABITANTS. The State has a small proportion of foreign-born inhabitants, the total being only 23,451. Among the leading Christian denominations are the Methodists, Baptists, Roman Catholics, Presbyterians, Lutherans, and Disciples. Charleston, on the Great Kanawha, is the capital. Other cities include Wheeling, Huntington.

Parkersburg, Martinsburg, Fairmont, Grafton, Moundsville, and Clarksburg. In 1900 the State had a population of 958,800. This number included 43,567 colored people, of whom 43,499 were Negroes. Population, 1910, 1,221,119.

HISTORY. West Virginia was a part of Virginia until the latter State passed the ordinance of secession on April 17, 1861. Shortly after the people of the western and northwestern part of Virginia called a convention at Wheeling, at which it was decided that the officers of the State who were opposed to the national government should not be recognized, and a State Legislature was called to meet at Wheeling. The new State thus formed was called Kanawha. and obtained permission to separate from Virginia by the Virginia Legislature. Congress admitted the State as West Virginia on June 19, 1863. Many volunteers from West Virginia served in the Civil War. It was the scene of John Brown's raid at Harper's Ferry and the battles at Philippi, Cheat Mountain, Beverly, and Carnifex Ferry. Since the war it has made rapid strides in the development of its natural resources and is constantly gaining in population and wealth.

WEST VIRGINIA, University of, a coeducational institution of higher learning at Morgantown, W. Va., established in 1868. was founded as a State university, being the successor of the West Virginia Agricultural College, the Woodburn Seminary, and the Monongahela Academy. The courses include arts and sciences, law, agriculture, commerce, music, engineering and mechanical arts, and military science and tactics. With it are affiliated preparatory schools located at Geyser, Morgantown, and Montgomery. The institution has a faculty of 120 instructors and professors and is attended by 2,150 students. The library contains 60,000 volumes and the value of the property is placed at \$950,000.

WETTERHORN (věť ter-horn), an elevated mountain peak of Switzerland, in the Grindelwald, ten miles southeast of Lake Brienz. Limestone constitutes the chief geological formation. In many places the slopes are nearly perpendicular for hundreds of feet. The mountain rises in three peaks, their respective heights being 12,125, 12,175, and 13,280 feet.

WEYLER (wā'lēr), Nicolau Valeriano, soldier, born at Palma, in the island of Majorca, Dec. 17, 1838. He first entered the military service as a Carlist and afterward invaded Africa against the Moors, where he secured an unenviable reputation for practicing acts of barbarity in subduing the natives. Subsequently he was made captain general of Catalonia, in Spain, and later governor general of Cuba. He reached Havana on Feb. 10, 1896, where he was given an enthusiastic reception, and a week later issued three proclamations establishing severe martial law. In 1898 he was superseded by General Blanco as commander of the Spanish forces

in Cuba, his recall being deemed essential in the interests of peace in Spanish-America. He made a trip through America on his way back to

NICOLAU V. WEYLER,

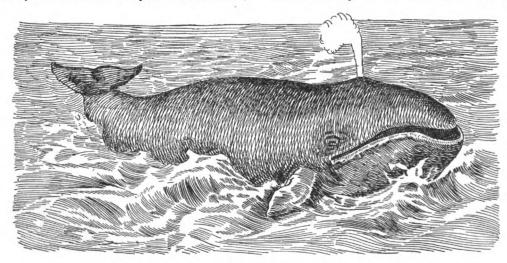
Europe, where he subsequently exercised much influence as a member in the cabinet of Sagasta.

WEYMAN (wi'man), Stanley John, novelist, born in Ludlow, England, Aug. 7, 1855. After graduating from Oxford University, he became classical instructor, in 1878, at the King's School, Chester. In 1881 he was admitted to the

bar and entered the practice of law, but gave considerable attention to literature. His first writings appeared in the *Cornhill Magazine*, in 1883. Soon after he went on an extended tour, visiting various parts of Europe. His chief literary works include "Story of Francis Cludde,"

under the present name in 1635. Population, 1905, 11,585; in 1910, 12,895.

WHALE, the common name of animals belonging to the order Cetacea, with which are included the porpoise and the dolphin. They are formed somewhat like fishes and like them live in the sea, but they are really mammals; that is, they are warm-blooded, breathe air by means of lungs, and their young are born after a long pregnancy in a well developed condition. The head constitutes about one-third of the body, the mouth is large, the lips are stiff and immovable, and the tail is flattened horizontally instead of vertically as in fishes. They have no external ear and the eyes are small and far back from the wide mouth. The posterior fins are absent, but the anterior fins are well developed, and under the skin of the latter are all the joints found in the human hand and arm. The anterior fins serve to balance the animal in the water, while the projectile movement is effected by the tail. Whales have two large nostrils on top of the head for breathing,



BALEEN WHALE.

"The Man in Black," "My Lady Rotha," "The House of the Wolf," and "Memoirs of a Minister of France." A number of his writings have been translated into French, German, and other continental languages.

WEYMOUTH (wā'muth), a town of Massachusetts, in Norfolk County, twelve miles southeast of Boston, on the New York, New Haven and Hartford Railroad. It has electric street railways, public waterworks, and sanitary sewerage. Among the features are the high school, the townhall, many fine churches, and the Tufts library. The manufactures embrace nails, isinglass, boots and shoes, fireworks, hardware, and machinery. It has a large trade in coal and lumber. The place was settled in 1623, when it was called Wessagusset, but was incorporated

and come to the surface about every twenty minutes to blow out water and take in air. Under the skin is a fatty substance called blubber, which in some whales is two feet thick. As it is lighter than water, it serves in enabling the whale to swim, and aids in keeping the blood warm in the cold, Arctic seas. This blubber yields a fine oil, but the whale is also hunted for its spermaceti, a white, oily substance contained in the head of the sperm whale, for whalebone, and for ambergris.

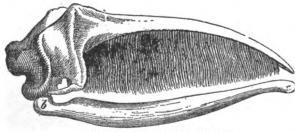
Two distinct families of whales are recognized—the baleen, or whalebone, whale and the sperm whale, or cachalot. The whalebone whale family includes the Greenland whale, or right whale, and the rorqual. These species have no teeth, but instead have plates of whale bone in

the mouth, and from them are suspended a kind of fringe, which serves to aid them in separating their food from the water. The Greenland whales commonly grow to a length of from 50 to 70 feet, while the rorqual whales attain a length of 170 to 200 feet, and are thought to be the largest species of living animals. Both of these species yield whalebone, a well-known horny substance derived from the thin, parallel plates in the upper part of the mouth. It is used for stiffening stays and for ribs in parasols and umbrellas. A young whale is usually eight to twelve feet long at birth and is suckled

by the mother for nearly a year.

Sperm whales are about as large as the Greenland whale, but differ from them in having teeth in the lower jaw and in yielding spermaceti and ambergris. The former is used in making candles and the latter for perfumery. Whale fisheries are not as important as formerly, but valuable catches are still obtained in the Bering Sea, off Greenland, and in the vicinity of Spitzbergen. Whale fishing is carried on by means of boats, from which harpoons are cast into the whales, and they are afterward slain with a lance. Harpoons are iron weapons, about three feet long, and to them a line is attached. When a whale is seen, the harpoon is thrown into its body by the harpooner, or by means of a harpoon gun. The whale dives out of sight as soon as it is struck by the harpoon, but comes up again in fifteen or twenty minutes to breathe, when a second harpoon is cast. At length it is overpowered and killed with the lance, a spear of iron about six feet long. It is then cut up and the oil is extracted from the blubber and the whalebone is dried. Petroleum has largely displaced candles made of whale oil, but it is still used largely for food and lighting in cold countries, especially by the Eskimos.

WHALEBONE, or Baleen, the horny plates or blades found in the mouth of the right whale, These plates number about 300 in the mouth of a full-grown animal, are from a few inches to twelve feet in length, and serve the purpose



SKULL OF THE BALEEN WHALE. a, Baleen, or bony plates; b. Lower Jaw-bone.

of retaining the food. It is not properly bone, but bears some resemblance to the horns of cattle and the hoofs of the mule and horse. In structure it is almost identical with the horns of the rhinoceros. Whalebone is used in making whip handles, stays in clothing, ribs of parasols and umbrellas, and in the manufacture of canes and upholstery. The decline of the whale fisheries has caused the price of whalebone to rise, hence it is replaced to some extent by steel and vulcanite.

WHANGHO. See Hoang-ho.

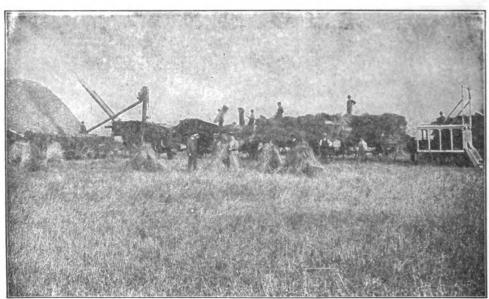
WHARF, a structure of wood or stone on the bank or margin of navigable waters, constructed so as to provide a suitable platform for the loading and unloading of vessels. They are built either as quays or piers, depending upon the depth of the water and the nature of the shore line. Quays are wharves that are built parallel with the shore, while piers extend into the water at right angles to the line of the shore. Wharves maintained on the margin of streams and where the tide has a material effect are usually in the form of quays, while those used in lakes and rivers are frequently constructed as piers. In most cases piles are driven into the bottom of the harbor and the framework is covered with heavy planking. In most countries the wharves are controlled by the national government and owners of ships are charged a nominal rental when their vessels make use of them. However, in the United States the privileges are controlled by the several states, which lease them to individuals or corporations, and in this way they are managed as an enterprise for the profit obtained from leases.

WHARTON (hwôr'tŭn), Edith, novelist, born in New York City, in 1862. She was educated by private tutors in her home and in 1885 married George Wharton, of Boston. Her writings have been widely read, both in America and Europe. She translated from the German Sudermann's "The Life That Is Lived." Her leading works include "The Greater Inclination," "Italian Villas and Their Gardens," "Crucial Instances," "The Touchstone," "The Valley of Decision," and "The House of Mirth."

WHARTON, Francis, jurist, born in Philadelphia, Pa., March 7, 1820; died Feb. 21, 1889.

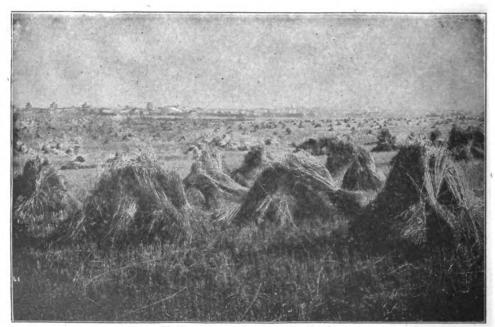
He graduated from Yale University in 1839, studied law, and began a successful practice in Philadelphia. In 1845 he became assistant attorney-general and in 1856 was made professor of logic and rhetoric at Kenton, Ohio, where he labored successfully for several years. In the meantime he made a tour of Europe, was ordained to the pastorate of the Episcopal Church, and for some time served as rector in Brookline, Mass. In 1885 he was appointed by President Cleveland as counsel of the State Department in Washington, D. C., and subse-

quently became editor of the Revolutionary Diplomatic Correspondence of the Federal government. His books include "A Treaty on Theism and Modern Skeptical Theories," "The Silence of Scripture," "A Treatise on the Law of Homi-



THRESHING BY ELECTRICITY, NEAR BRANDON

In the fall of the year the prairies are stripped of their ripened grain and the gathered wealth is threshed by some one of the many wonderful devices offered by modern mechanical science. As a general thing steam is the motive power used in threshing, but other forces also are called into play, and among them that of electricity has been evoked to work the fans and screens that prepare the grain for market.



WHEAT FIELDS NEAR VIRDEN

The magnitude of the wheat fields of Manitoba is a feature that excites the astonishment of the Old World tourist and the admiration of the New World farmer. It is easy to find points where the level prairie as far as the eye can see is a billowy ocean of waving grain in the growing season, and a vast stretch of sheaf-dotted plain in the harvest time. Virden, situated a little west of Brandon, lies in a typical farming area. (Art. Wheat)

eide in the United States," and "A Treatise on the Criminal Law of the United States."

WHATELY (hwāt'li), Richard, clergyman and author, born in London, England, Feb. 1, 1787; died in Dublin, Oct. 8, 1863. His father was a clergyman at Bristol, where he attended a private school, and afterward graduated from Oxford University. In 1811 he was elected fellow of Oriel College, but three years later became a clergyman. He did vigorous work in a parish for two years, but in 1825 was made principal of Saint Albans Hall, where he greatly improved the instruction and increased the classes, and subsequently became a lecturer on economics. In 1831 he was appointed Archbishop of Dublin, in which capacity he did much for the mission and school work in Ireland and rendered services by extending large charities to the people, especially during the famine. He was not only a tireless worker in the church and school, but was a writer on religious, historical, and philosophical topics. Among his best known works are "Historic Doubts Relative to Napoleon Bonaparte," "Use and Abuse of Party Spirit in Matters of Religion," "Christian Evidences," "Elements of Logic," "Scriptural Revelations Concerning a Future State," "Lectures on the Parables," and "Lectures on the Study of Saint Paul's Epistles."

WHEAT, an important and largely cultivated cereal. It is excelled by rice alone with reference to the number of people using it as



a staple food. The plant that produces this grain is a tall, slender annual or biennial, having a hollow, jointed stem and bearing at its summit a somewhat four-cornered spike of usually four-flowered spikelets, called the ear, or head. Though not known in a wild state, it is thought to have come from Asia. It has

been cultivated so long that many species have been developed, all more or less valuable as a food product and adapted to different soils and climates.

Although wheat flourishes in regions considerably different from each other and is cultivated in many parts of the earth, it thrives best in a temperate climate and in rich clay and loam soils. The chief species include bearded wheat, unbearded wheat, and spelt or German wheat. Bearded wheat has a kind of awn or slender spine extending from the ears, while unbearded wheat is awnless. Spelt is less valuable than other species, but it possesses the advantage of growing in poorer soils and at greater eleva-tions. Wheat is distinguished also as spring and winter, or fall, wheat. Spring wheat is sown in the spring and harvested in July or August, while winter wheat is sown in autumn and is harvested the following summer. While both kinds are of high value, winter wheat usually commands a slightly higher price in the market, owing to its yielding a larger per cent. of flour. Two other classes of wheat are the red wheat and white wheat, these names being applied on account of the color of the grain. The white wheat is less hardy than the red, but it yields better and is of a finer quality.

Few plants have a higher value than wheat. As a food product it possesses much utility, owing to its containing a large per cent. of starch and gluten. It likewise has mineral properties of value in supporting the body. The grains are removed from the husks by a threshing machine and are afterward ground into flour. Besides the use of wheat flour in making bread, it is employed extensively in the production of starch, crackers, and macaroni. The bran, shorts, and husks are of value as food for animals, and the straw is employed for animal food and in the manufacture of various articles, such as straw hats and mats. The total production of wheat in the world is estimated at 2,675,000,000 bushels, of which Europe produces about one-half. At present the United States is the greatest wheat-producing country in the world, the annual production being 850,500,000 bushels. Minnesota and North Dakota have long ranked as the leading wheat-producing states, the annual yield of the former being about 95,000,000 bushels, and of the latter, 72,-500,000 bushels. As a whole, the most productive wheat-growing region is in the northwestern states. The states ranking next to Minnesota and North Dakota in growing wheat include Kansas, South Dakota, Nebraska, Ohio, Indiana, Michigan, California, Texas, Iowa, Oregon, Washington, and Pennsylvania. Canada produces annually about 325,000,000 bushels, the largest crops being grown in Manitoba, Ontario, Saskatchewan, and Alberta. Russia, France, India, Austria, Australia, Germany, Spain, and Italy are leading wheat-producing countries. Chicago, Minneapolis, Duluth, Buffalo, Winnipeg, and Vancouver are among the leading wheat markets of North America.

WHEAT MIDGE, an insect which is harmful to wheat, related more or less closely to the Hessian fly. It is native to Europe, but was brought to the Province of Quebec, Canada, at an early date, whence it has spread to the region extending through the central part of North America. The adult is of an orange or yellow color, but does not make its appearance until in early summer. It is about one-tenth of an inch long and lays small eggs in the heads of wheat as the grain stands in the field, and when the larvae appear they extract the milky juice and cause the heads to blight. The larvae, after attaining full growth, descend to the ground and hibernate in small cocoons. Deep plowing causes them to be destroyed in large numbers

WHEATON (hwe'tun), Loyd, soldier, born at Fairfield, Mich., July 15, 1838. He joined the Federal army as first sergeant at the beginning of the Civil War, became captain in 1862, major in 1863, and lieutenant colonel in the volunteer service in 1864. In 1866 he was made captain in the regular army and in 1891 became major. He aided in suppressing a Fenian raid from United States territory upon Manitoba in 1871, and in 1874 took part in Custer's expedition to the Black Hills. During the Spanish-American War he was brigadier general and commanded a division of the seventh army corps in Cuba. In 1899 he was sent to the Philippines to aid in suppressing the insurrection in Luzón. He was retired from the service in 1902.

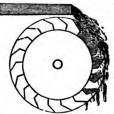
WHEATON, Henry, author and diplomat, born in Providence, R. I., Nov. 27, 1785; died March 11, 1848. He studied at Brown University, where he graduated in 1802, and three years later was admitted to the bar. Subsequently he studied in Europe, but returned to the United States in 1807 to begin the practice of law at Providence. In 1812 he removed to New York and for some time edited the National Advocate, which became an influential organ in politics. He was made reporter of the United States Supreme Court in 1816, serving until 1827, and for some time was chargé d' affaires in Denmark, where he displayed great diplomatic skill. From 1837 to 1846 he was minister plenipotentiary at the court of Prussia. His "Elements of International Law," which has been translated into several languages, is his best known publication. Other writings include "A History of the Northmen," "Digest of the Decisions of the Supreme Court of the United States," "A Digest of the Law of Maritime Captures and Prizes," and "A History of the Law of Nations in Europe and America.

WHEATSTONE (hwēt'stǔn), Sir Charles, electrician and inventor, born in Gloucester, England, in 1802; died in Paris, France, Oct. 19, 1875. He was the son of a music seller and be-

came a musical instrument maker. Besides making a number of discoveries in acoustics, he extended his investigations to light and electricity, and in 1834 became professor of King's College, London. In 1837 he obtained a patent for a kind of telegraph, but it was not adapted to practical use until after Morse patented his telegraphic instrument. Other inventions include an electric alarm, an improved stereoscope, and several electrical appliances. In 1838 he became a member of the Royal Society and in 1868 was knighted by Queen Victoria. He contributed largely to science by writing a number of valuable papers, among them "New Experiments in Sound," "Acoustic Figures," and "Experiments to Measure the Velocity of Electricity." He contributed largely to the Philosophical Magazine and the Journal of the Royal Institution.

WHEEL, a circular frame or solid disk employed to reduce friction and facilitate movement, as in vehicles; to produce rotary motion,

as in machines; or to modify speed, as in the form of pulleys. Many kinds of wheels are employed in the arts and industries, the form and structure depending on their uses. The only feature which is universally characteristic



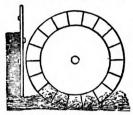
OVERSHOT WHEEL.

in wheels is rotation, which may be either partial or entire. When the wheel is of elliptical form, it is called a cam, and when the edges are toothed, it is termed a gear. The center piece is designated a shaft, or arbor, when the wheel turns with it, and an axle when the wheel turns on it. Wheels for vehicles are commonly made of wood, with a wooden hub strengthened by bands, inside of which is a metallic box or bushing for the axle skein, the spokes being mortised into the hub and tenoned into the rim or felly, the whole being strengthened by a metallic tire. Other vehicle wheels have a light rim connected with the hub by wire spokes, as in modern bicycles and some other vehicles, or they are of iron or steel, either cast in one piece or with a metallic hub connected by plates with a rim.

Within recent years rubber tires have been placed on many carriages and light vehicles, though these are generally attached to a main tire of metal, while pneumatic tires have come into general use on bicycles. Car wheels are usually solid and are made either of iron or steel, of iron and steel, or of paper, iron, and steel, of iron and steel, are made of similar material, but in most cases they are lightened by having cast spokes. The wheels used in machinery are known as cog, belt, spur, crown, fly, ratchet, pinion, or balance wheels. Sets of wheels in machinery are joined by belts or

bands, or transmit motion by means of teeth or cogs.

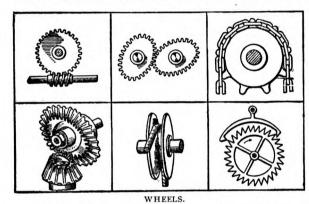
The development of the power of water through water wheels is about five centuries old. No exact date can be given for the first device



UNDERSHOT WHEEL.

of this kind, the earliest authentic record being a description of the water wheels at Lyons, France, dated in 1555. There are three ways in which the energy or motion of a running stream can be transferred to a water

wheel, namely, by impact, by weight, and by the reaction of the escaping jet. An undershot wheel is driven by impact, the wheel being moved mainly by the impact or blow produced by the moving water striking the flat boards of the wheel. An overshot wheel has buckets or boxes



Screw Gears. Bevel Gears.

Elliptical Gears.

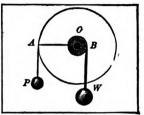
Sprocket Wheel. Escapement.

on the rim and the water, which flows into the buckets from above, turns the wheel by its momentum and by the weight of the water in the buckets, the side of the wheel that receives the water being heavier than the opposite side. The reaction of the escaping jet is utilized in the turbine water wheel, which is driven partly by the momentum of the moving water and partly by the weight of the water in the buckets. Many forms of turbines are in use, the axis of rotation being either vertical or horizontal. The size of all classes of water wheels varies with the water supply and the power which is desired. See **Turbine**.

WHEEL AND AXLE, a machine in the form of a continuous lever, in which force is applied at the circumference of a wheel to raise a weight attached to a rope wound around the axle. A windlass is a form of wheel and axle. When the crank of a windlass is turned, the rope is wound around the axle, which causes the weight at the lower end of the rope to be raised. The wheel and axle is a modifica-

tion of the lever, the fulcrum is at the axis, the arm of the force is the radius of the wheel, and the arm of the weight is the radius of the

axle. One complete turn of the wheel causes the weight to be raised only the length of the rope wound once around the axle, hence a force of a pound weight applied at the axle causes a weight to be raised as many more pounds, hung to the axle, as the



WHEEL AND AXLE.

A, circumference of the wheel;
O, circumference of the axle; P,
power; W, weight; B, radius of
the axle.

circumference of the wheel is greater than the axle. When a winch is substituted for the wheel, the circumference described by the power in one revolution is substituted for the circumference of the wheel. The capstan is an ex-

ample of this mechanical power. It is used extensively in moving houses and bodies of large bulk, while the windlass is used for raising water from a well.

WHEELER (whel'er), Benjamin Ide, educator, born at Randolph, Mass., July 15, 1854. He graduated at Brown University in 1875 and subsequently studied at Heidelberg, Germany. On returning to America, he taught in Brown, Harvard, and Cornell universities and in 1899 became president of the University of California. He was honored by official positions in numerous state and national educational and scientific associations. Among his publications are "The Greek Noun-Accent," "Introduction to the History of Language," "Life of Alexander the Great," "Dionysios and Immortality,"

"Analogy in Language," and "Organization of Higher Education in the United States."

WHEELER, Joseph, soldier and statesman. born in Augusta, Ga., Sept. 10, 1836; died Jan.

25, 1906. In 1859 he graduated from the West Point Military Academy and soon after became lieutenant of cavalry in New Mexico. He resigned from the Union service in 1861 to enter the Confederate army as lieutenant of artil-



JOSEPH WHEELER.

lery. His efficient services caused him to be promoted successively. He was made commander of an army corps and in 1862 was assigned to a command of cavalry in the West, where he continued until the war closed. He received the thanks of the Confederate Congress and of the South Carolina Legislature for successful military operations. In 1866 he was appointed professor of philosophy in the Louisiana State Seminary, but declined in order to enter the law practice at Wheeler, Ala. He was elected to Congress from Alabama as a Democrat in 1880 and was reëlected in 1884, in 1888, and in 1894. In 1898 he was made major general of volunteers in command of dismounted cavalry in the Santiago campaign of the Spanish-American War, and subsequently served as brigadier general in the Philippines, retiring with that rank in 1900. He published "The Santiago Campaign."

WHEELER, William Almon, statesman, born in Malone, N. Y., June 30, 1819; died there June 14, 1887. After securing his education and being admitted to the bar, he entered upon a successful law practice and was United States district attorney in New York from 1845 to 1849. He served in the New York State senate from 1858 to 1859, was elected to Congress as a Republican in 1860, and was reëlected consecutively, serving until 1877. In 1874 he wrote the famous compromise measure which quieted political disturbances in Louisiana, and two years later was the successful Republican nominee for Vice President. He served in that office during the Presidency of Hayes and became remarkably popular on account of great liberality and eminent ability. In 1881 he retired from public life and remained a resident of Malone until his death.

WHEELING (hwelling), a city of West Virginia, in Ohio County, seventy miles southwest of Pittsburg, Pa., on the Baltimore and Ohio, the Pennsylvania, the Wheeling and Lake Erie, the Pittsburg, Cincinnati, Chicago and Saint Louis, and other railroads. It is conveniently situated on the Ohio River, in the Pan Handle district of the State, and has communication by a number of electric railways. The city is well built, containing an excellent courthouse, city hall, United States customhouse and post office, and numerous school buildings churches. Other features include the Krugar Monument, the public library, the Haskin Hospital, the Linsley Institute, the Saint Joseph's Academy, the Wheeling Female Academy, and the Mount de Chantal Academy. Extensive deposits of coal and natural gas are in the vicinity. Among the chief manufactures are paper, nails, glass, leather, hardware, pottery, steam engines, boilers, cotton and woolen goods, and farming implements.

Wheeling is well provided with modern utilities. It has extensive systems of waterworks and sanitary sewerage. The streets are paved substantially and are lighted by gas and electricity. A part of the city is situated on Zane's Island, a tract of 400 acres in the Ohio River,

which is reached by a suspension bridge which is 1,012 feet long. Wheeling was first settled in 1770. Fort Henry, named in honor of Patrick Henry, was built here in 1774. For many years it was an outpost of defense against the Indians. It became the capital of West Virginia when that State was admitted, in 1863, and remained the seat of government until 1870, when Charleston was made the capital. It was the capital from 1875 until 1885, when Charleston became the permanent capital. Population, 1900, 38,878; in 1910, 41,641.

WHIG, the name applied in England to the opponents of James II. Afterward the name was assumed in North America by the supporters of the cause of the colonies against the King of England in the Revolution. The Whigs disappeared from politics after the Revolution had been successfully accomplished and the people became divided into Federalists and Democrats. A division of sentiment came about in the administration of Andrew Jackson, when numerous small parties began to form, and in 1834 James Watson Webb led the opposition against the party of Jackson in forming the new Whig party, the name being assumed because the new party, like the Whigs of the American Revolution, declared itself against executive usurpations. It favored everything opposed by Jackson, namely, a national bank, a high protective tariff, the passage of bills over the veto by a majority vote, limitation of the power of removal from office, and extensive internal im-

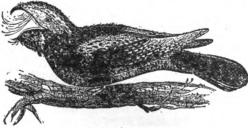
provements.

William H. Harrison was the Whig candidate for President in 1836, but was defeated by Van Buren. He was again nominated in 1840 and defeated Van Buren, receiving 234 electoral votes, while the latter received 60. The party had a good working majority in each house of Congress, but Harrison died shortly after being installed in office, when Tyler became President. The latter showed strong democratic tendencies by vetoing two bank bills and two tariff bills and distributing the proceeds of land sales to the states. He was accordingly declared to be out of the party and Henry Clay became the candidate for President in 1844, but was defeated by James K. Polk. In 1848 Zachary Taylor, the hero of the Mexican War, was nominated and elected President, but he died in office and was succeeded by his Vice President, Millard Fillmore. The party became weakened by accepting the Compromise of 1850, which divided it into Conscience Whigs and Cotton Whigs, and in the election of 1852 the candidate, Winfield Scott, met with defeat. Many Whigs soon after joined the American party in the North, while the Southern Whigs generally united with the Democrats. A number of other parties, such as the Free Soilers, Constitutional Unionists, and Abolitionists, were strengthened, and from these elements the present Republican party was formed.

WHIPPLE (hwip'p'l), Abraham, naval officer, born in Providence, R. I., Sept. 16, 1733; died in Marietta, Ohio, May 29, 1819. He entered the navy at an early age and from 1759 to 1760 commanded the privateer Gamecock in the French and Indian War. In 1772 he headed the expedition which burned the Gaspe in Narragansett Bay, and at the beginning of the Revolutionary War was placed in command of two Rhode Island vessels. He commanded the Providence in 1776, which captured more British vessels than any other American ship. In 1780 he was taken a prisoner near Charleston, but was soon after released and in 1784 visited London. After resigning from the naval service, he joined the Ohio Company and settled at Marietta, where he resided until his death.

WHIPPLE, Henry Bennington, bishop, born at Adams, N. Y., Feb. 15, 1822; died Sept. 16, 1901. He gave up his college course because of ill health and engaged in a business career. Later he studied theology privately and war granted holy orders in 1850. Soon after he became rector at Rome, N. Y., but removed to Chicago in 1857. Two years later he was consecrated bishop of the Protestant Episcopal Church for Minnesota. He organized the Bishop Seabury Mission at Faribault, out of which have grown the Seabury Divinity School and the Cathedral of our Merciful Savior. Several successful missions were planted by him among the Indians. He is distinguished as an advocate of free churches. His writings include "Lights and Shadows of a Long Episcopate."

WHIP-POOR-WILL, a bird native to North America, which was so named from its cry, resembling the words whip poor Will. It is closely allied to the goatsucker of Europe. The length is about ten inches, with an alar extent of about twenty inches. The plumage is tawny-



WHIP-POOR-WILL.

brown and is much mottled with white and gray spots. A number of species have been described, all of which fly about in the evening in search of food. They skim along near the ground without making a noise, thus enabling them to catch the insects on which they feed. These birds retire into the woods during the day. Their familiar cry is heard mostly in the evening. They breed about the middle of May, incubating their eggs in rude nests on or near the ground.

WHIRLPOOL (hwerl'pool), an eddy or vortex in a river or in the sea, which is caused by the water flowing against a peculiarly formed bank, by the meeting of two currents, or by the action of winds upon currents and tides. Small whirlpools may be seen on nearly every stream, but they assume gigantic size in many places of the ocean and oceanic channels, where their motion attracts and engulfs floating objects. The most famous whirlpool in history is that of Charybdis, near Sicily, and another of considerable interest is the Maelstrom, in the Lofoden Islands, northwest of Norway. However, these and other famous whirlpools frequently mentioned have been greatly exaggerated, and the dangers attending them have been much overdrawn to lend enchantment to the tales connected with them.

WHIRLWIND, a local wind in which a body of air moves in a circular or spiral course, the movement nearly approaching the horizontal of the place where it may be situated. The movement of such a wind is about an axis and the plane or direction in which the whirling motion takes place may cause the axis to vary between the nearly horizontal up to a true vertical. Two currents of air which move in different directions cause a whirlwind, which may vary in size from a small eddy to a hurricane a thousand miles in diameter. Usually the cause may be assigned to a portion of the surface of the earth becoming highly heated, when the currents of air moving upward are replaced by a rush of air from all sides to take their place.



DUST WHIRLWIND IN ARABIA.

An observer may see the entire whirl, if it is of small size and passes over dusty ground, but large whirls are only seen in part and appear as straight-lined winds. Whirlwinds seldom occur on hilly ground and never take place when a strong wind is blowing. All whirls of considerable size are given a uniform direction by the rotation of the earth, from left to right in

the Southern Hemisphere and from right to left in the Northern. See Storms.

WHISKY (hwis'ki), an alcoholic spirit obtained by the distillation of a fermented starchy compound. The name is of Celtic origin and was derived from the word uisgebeatha, which means water of life. Although it was employed originally as a medicine, it soon became a beverage, and its use rapidly spread to the European continent. It was first made by distilling malted brandy, but is now derived also from wheat, corn, molasses, rye, rice, potatoes, and many other vegetable products containing starch. Whisky is generally classified as grain whisky and malt whisky. The former is considered the more inferior and is derived from unmalted grain, as corn, oats, barley, wheat, etc., and from rice, sugar, molasses, and potatoes. The best grade of malt whisky is made from barley, but good grades are obtained by malting wheat and rye. The product is usually named from the kind of grain which is employed in its manufacture, as corn whisky, rye whisky, and wheat whisky. The grains impart to it a characteristic flavor, but it is modified somewhat by the ferment used.

Whisky is used largely in making alcohol, gin, and brandy, but more commonly as a beverage. Many doctors prescribe it as a stimulating medicine, and, like alcohol, it enters largely into the preservative arts. It is almost colorless when first distilled, but assumes a reddish hue from the barrel into which it is drawn, but some grades are colored artificially. The United States manufactures the largest quantity of whisky and the heavy tax upon it is an important source of revenue to the government, reaching \$80,750,000 annually. A bushel of grain yields about three and a half gallons of whisky and the manufacturer must pay a tax on that amount for every bushel of grain mashed. See Alcohol.

WHISKY INSURRECTION, a revolt in the United States, due to the enactment of a Federal excise law. It took place in the western part of Pennsylvania, in 1794, when the authorities undertook to enforce the collection of taxes upon whisky. Congress passed this law in 1791 as a means of raising revenue and considerable opposition formed against it in Virginia, North Carolina, and Pennsylvania, where a large number of the people were engaged in distillation and whisky was used as a medium of exchange. The masses held insurrectionary meetings and a number of the revenue officers were tarred and feathered. President Washington sent a force of 15,000 men to quiet the revolt in October, 1794, when the disturbances were suppressed. Several of the leaders were arrested and founded guilty of treason, but President Washington pardoned them. The affair had a good influence upon the nation, since it showed that the Federal government was determined to exercise its authority.

WHISKY RING, the name applied to a combination of distillers and revenue officers at Saint Louis in 1872, for the purpose of defrauding the government of the internal revenue tax on distilled liquors. It spread to many parts of the country, with branches at Cincinnati, Chicago, Peoria, Milwaukee, and New Orleans, and even had agents in Washington to cooperate with certain government officials. Myron Colony, of the Cotton Exchange, was appointed to make a secret investigation of the frauds. The disclosures that followed implicated the private secretary of President Grant, the chief clerk of the Treasury Department, and many other government officials. Indictments were obtained against 238 persons, many of whom were convicted and fined. The amount involved in the frauds aggregated \$1,650,000.

WHIST, a game played with the full pack of 52 cards, so named because it requires great attention and silence. The game requires four persons, of whom those sitting opposite to each other are partners. At the beginning the pack is cut for partners, the two cutting respectively the highest and lowest cards play together, and the first deal is taken by the one who cuts the lowest card. After shuffling the cards carefully, the pack is cut by the adversary sitting on the right hand, and the cards are then dealt one by one to each of the players, commencing on the left, until the pack is exhausted. The last card, called the trump, is turned up by the dealer and remains exposed until the first trick is turned. In 1743 Edmond Hoyle published a set of rules in his "Short Treatise on the Game of Whist," and it remains substantially in force at the present time. However, the rules differ somewhat in various countries and those wishing to study them should refer to a guide. A standard work on the subject is Cavendish's "Principles of Whist, Stated and Explained."

WHISTLER (hwis'ler), James Abbott McNeill, artist, born in Lowell, Mass., in 1834; died July 17, 1903. After graduating from the United States Military Academy, West Point, he studied art in France, and in 1863 became a resident of London. He was chosen president of the British Society of Artists in 1886. His productions are very numerous and are much admired because of the harmonies and contrasts of color which he so effectually obtained. Among his best known works are "Harmony in Brown and Black," "The Gold Girl," "Harmony in Gray and Green," and "Nocturne in Blue and Silver.' His portraits include one of Thomas Carlyle and one entitled "My Mother." He published "Four Masters of Etching," "The Gentle Art of Making Enemies," and "Ten O'clock."

WHITBY (hwit'bi), a seaport city of England, in Yorkshire, on the North Sea. It occupies a fine site on the Esk River, but many of the streets are narrow and platted irregularly. It has had some growth in population and trade

(Opp. 3139) EDWARD DOUGLASS WHITE.

Judge White was appointed Chief Justice of the United States Supreme Court by President Taft in 1910.

since the construction of a railway line to the port, but it is noted chiefly for its history. In the time of Queen Elizabeth it ranked as a center of manufactures of alum, and in its ship-yards were built the vessels used by Captain Cook in his exploring expeditions. The most noteworthy building now in the city is the parish church, which occupies a position on a cliff about 350 feet high and is reached by a flight of 210 steps. It has excellent herring fisheries and quarries of ironstone. The fine scenery in the vicinity and several mineral springs have stimulated interest in it as a popular summer resort. Population, 1918, 12,843.

WHITE, Andrew Dickson, educator and diplomatist, born in Homer, N. Y., Nov. 7, 1832. He studied in the public schools of Syracuse and at Yale University, graduating from the latter in 1853. In 1857 he became professor of history and English literature in the University of Michigan and in 1867 was made president of Cornell University, which position he held until 1885. On resigning the presidency, he made the university a gift of his historical library, comprising about 30,000 volumes, and a quantity of valuable equipments. He traveled in Europe from 1867 to 1868, was appointed a commissioner to Santo Domingo by President Grant in 1871, and was made minister to Germany by President Hayes in 1879, remaining absent from Cornell for two years. President Cleveland appointed him on the commission to investigate the Venezuela boundary line in 1896, and President McKinley made him ambassador to Germany the following year, the duties of which position he performed with eminent ability. White was honored by an appointment as regent of the Smithsonian Institution and as a member of the Legion of Honor of France. His writings include "Lectures Relating to Cornell University," "Coeducation of the Sexes," "The New Germany," "History of the Warfare of Science with Theology," "A History of the Doctrine of Comets," "Reminiscences of My Diplomatic Life," and "The Warfare of Humanity With Unreason."

WHITE, Edward Douglass, jurist, born in the parish of Lafourche, La., Nov. 3, 1845. After studying at Mount Saint Mary's College, Emmittsburg, Md., he pursued a course at the Jesuit College of New Orleans and at Georgetown College, D. C. He served in the Confederate army, studied law after the close of the war, and in 1868 was admitted to the Louisiana bar. In 1874 he was elected State senator of Louisiana and four years later became an associate justice of the Louisiana supreme court. He succeeded James B. Eustis in the United States Senate as a Democrat in 1891, and was appointed as associate justice of the United States Supreme Court by President Cleveland in 1894. His addresses and decisions give evidence of much ability and devotion to duty.

WHITE, Emerson Elbridge, author and

lecturer, born in Portage County, Ohio, in 1829; died Oct. 21, 1902. He attended the public schools and Cleveland University, after which he was a grade teacher in the schools of Cleveland. In 1856 he was made superintendent of schools at Portsmouth, Ohio, was for some time publisher of the Ohio Educational Monthly, and in 1863 became State school commissioner. He was elected president of Purdue University, Lafayette, Ind., in 1876, and was superintendent of schools in Cincinnati from 1886 to 1889. He is best known by a series of text-books and works on education, which are in extensive use in public schools and colleges. His professional books include "School Management" and "Elements of Pedagogy.'

WHITE, Gilbert, naturalist, born at Selborne, England, July 18, 1720; died June 20, 1793. He studied at Oriel College, Oxford, where he became a fellow in 1844, which position he retained throughout his life. In 1752 he was made senior proctor of the university and soon after took orders in the Church of England, but he did not accept preferment in ecclesiastical work. Most of his time was spent in the study of natural history on his estate. His most important writings appeared in 1789 under the title "Natural History and Antiquities of Selborne," which contains interesting accounts of birds, insects, trees, and flowers. This work is commended by Darwin because of its accuracy in describing nature.

WHITE, Henry Kirke, poet, born in Nottingham, England, March 21, 1785; died Oct. 19, 1806. He was apprenticed to a weaver, but afterward studied law. Several verses written by him in his fifteenth year were published in magazines and subsequently he became a regular contributor to the Monthly Mirror. A volume of poetry entitled "Clifton Grove" won a scholarship at Cambridge, where he became a tutor in mathematics. He died from excessive study while at Cambridge. "The Star of Bethlehem" is a beautiful hymn written by him. His "Complete Poetical Works" was republished several times after his death.

WHITE, Horace, journalist, born at Colebrook, N. H., Aug. 10, 1834; died Sept. 16, 1916. He graduated at Beloit College, Wisconsin, in 1853, and became a writer for the Chicago Tribune. In 1865 he became its editor and in 1883 accepted a position as editorial writer for the Evening Post, New York. He retired from the position of editor in chief in 1903, after which he gave his time largely to literature. His books include "The Roman History of Appian of Alexandria" and "Money and Banking Illustrated by American History."

WHITE, Hugh Lawson, public man, born in Iredell County, North Carolina, Oct. 30, 1773; died April 10, 1840. He settled at Knoxville, Tenn., at an early age and in 1793 became a volunteer against the Cherokee Indians. Later he studied law in Pennsylvania and began to

practice in Knoxville, where he was made judge of the State supreme court in 1801. He was appointed United States district attorney in 1807, and became State senator two years later. In 1825 he succeeded Andrew Jackson in the United States Senate. He was nominated for President of the United States by the Legislature of Tennessee in 1836, when he carried the State by a large majority. The only other State carried by him was Georgia, giving him a total of 26 electoral votes. Later he joined the Whig party, but resigned from the Senate of the United States because the State Legislature instructed him to vote for the subtreasury bill. His friends spoke of him as the "Cato of the United States," owing to his devotion to principle.

WHITE, Richard Grant, author, born in New York City, May 22, 1821; died there Aug. 8, 1885. He took a college course in law and medicine, but soon gave up the practice of both for a literary career. In 1845 he became connected with the New York Courier and Enquirer, of which he was the editor from 1855 to 1859. Besides being an efficient editorial and general writer, he was noted as a musician and art critic. In 1853 he published his first volume, entitled "Hand-Book of Christian Art," and at the time of the Civil War wrote "The Gospel of Peace," a critical satire on sympathizers with the Confederate cause. Many of his essays and criticisms were published in the Atlantic Monthly and in Putnam's Magazine. His best known works include "Words and Their Uses," "The Fate of Mansfield Humphrey," "National Hymns," "England Without and Within," "Biographical and Critical Hand-Book of Christian Art," and "Studies in Shakespeare."

WHITE, Stewart Edward, novelist, born in Grand Rapids, Mich., March 12, 1873. He studied at the high school in his native city, graduated from the University of Michigan in 1895, and studied law at the Columbia Law School. His early life was spent in the forests of his native State, where he came in touch with the scenes that enabled him to interweave his writings with many sketches taken from nature. His books include "The Blazed Trail," "The Conjuror's House," "The Magic Forest," "The Mountain," "The Silent Places," and "The Blazed Trail Stories."

WHITE, William, clergyman, born in Philadelphia, Pa., April 4, 1748; died there July 17, 1836. In 1765 he graduated at the College of Philadelphia and, after taking a theological course, became rector of Saint Peter's Church, Philadelphia, in which he served from 1779 until his death. The University of Pennsylvania conferred a degree upon him in 1832. He became bishop of the diocese of Pennsylvania, in 1786, and the following year was consecrated by the Archbishop of Canterbury in Lambeth Palace Chapel, England. He joined Bishop Seabury of

Cincinnati in revising the "Book of Common Prayer," which was long in common use in the American Episcopal Church. Among his writings is "Memoirs of the Protestant Episcopal Church in the United States."

WHITE, William Allen, author and journalist, born at Emporia, Kan., in 1868. He studied in the public schools and at the University of Kansas, and in 1890 became editor of the Eldorado Daily Republican. Subsequently he was associated for some years with newspapers in Kansas City and Emporia. He became well known in 1896 by publishing an editorial under the caption "What's the Matter With Kansas?" This article was reprinted throughout the country. His books include "The Court of Boyville," "The Real Issue," and "Strategems and Spoils."

WHITEBAIT, a class of small fishes of the herring family, which are particularly abundant at the mouth of the Thames, England, where they are caught in large quantities. They are from three to six inches long, have a pale ashygreen color above, and the sides and lower parts are white. These fishes come up the river with the tide, especially in the spring and summer. They are considered a delicacy by the aristocracy of London, where they are served on festal occasions.

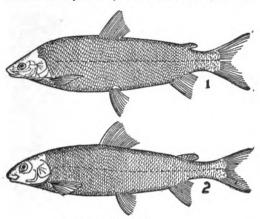
WHITE CAPS, the name applied in the United States to a mass of people who assume the punishment of persons for real or imaginary offences. Bodies of this kind were formed in places where the law delayed punishment, or the penalty imposed was thought too light, hence those who joined such movements undertook to administer what they considered proper punishment. The name was applied from the large white caps worn to conceal identity. In some instances the punishment consisted only of warning people to leave a neighborhood, but in other instances violence and injustice were perpetrated upon innocent parties.

WHITEFIELD (hwit'feld), George, eminent clergyman, born in Gloucester, England. Dec. 16, 1714; died in Newburyport, Mass., Sept. 30, 1770. He entered Oxford University in 1833, where he became interested in the doctrine and practice of the Methodists and formed a close friendship with John Wesley. In 1836 he was ordained deacon and shortly after made several evangelizing tours in England, but in 1836 proceeded as a missionary to Georgia. He returned to England after three months, but, being slighted by the clergy, he began to preach in the open air. His powerful oratory attracted thousands of people, while his voice was sufficiently strong to reach the utmost limits of his vast assemblages. A slight difference in doctrine caused him to withdraw from the Wesleyan communion, and Whitefield henceforth became known as the founder of the Calvinistic Methodists in Great Britain. He visited Scotland, Wales, and America at different times, laboring

3141

in each country with unremitting perseverance. His death occurred at Newburyport, Mass., while on his seventh evangelizing tour in America.

WHITEFISH (hwit'fish), the name commonly applied to several species of fishes of the salmon family. They are found mostly in the



1, Common Whitefish.
2, Rocky Mountain Whitefish.

lakes of the northern regions of North America and are generally favored among the food fishes. About twenty species are native to the lakes of the northern part of the United States and Canada, and in many cases find their way far up the rivers and smaller streams. They usually weigh twelve to fourteen ounces, but the larger species reach four to eight pounds. The common whitefish of the Great Lakes is the most important of the species. Other fishes frequently mentioned as whitefish include the menhaden, the silver salmon, the sewen, and the European whiting.

WHITE HOUSE, the official residence of the President of the United States, in Washington, D. C., so called because it is painted white. It is located on Pennsylvania Avenue, a mile and a half from the Capitol. The original structure was commenced in 1792, when the cornerstone was laid, and the building was completed in 1800. John Adams was the first President to occupy the mansion. The British captured Washington in 1814 and burned the White House together with the Capitol and other buildings, but its restoration was authorized by Congress the following year. In 1818 the new structure was ready to be occupied, which has since been the official presidential residence. The building is modeled after the house of the Duke of Leinster at Dublin, Ireland, is 170 feet long and 86 feet wide, and has a beautiful colonnade in front and a circular porch in the rear. An attractive park with fine walks and beautiful plants surrounds the building. Formerly the executive business was transacted largely in the White House, but separate offices were erected for that purpose a short distance from the building in 1903.

WHITE LADY, in German legends, a feminine spirit reputed to appear in the castles of German princes and nobles at the approach of an important event. She is represented in story as robed in beautiful garments of white and at her side is a bunch of keys, with which she is enabled to pass into the different apartments. Some of the beautiful legends connect her with the nursery, where she rocks and watches over the slumbering children at night. The most famous legend connected with the White Lady is that known as "Bertha of Rosenberg," in Bohemia, and next to it is the creation of Sir Walter Scott, called "The White Lady of Avenel."

WHITE LEAD, a dense, white powder. It is soluble in diluted nitric or acetic acid, but is insoluble in water. It is manufactured by the joint action of carbonic dioxide and vapor of acetic acid on metallic lead. The most common process is to place rolled sheets of lead in earthen pots and pour over them a quantity of acetic acid, that is, vinegar. A large number of these pots are prepared and loosely covered with disks of lead, after which they are covered with refuse bark from tanneries and set away for a period of five to six weeks. In the meantime the substances undergo a slow oxidation and disengage carbonic dioxide, which in the presence of the vinegar converts the surface of the lead into carbonate. The pots are opened and the white lead is scraped from the remaining metal as soon as a considerable quantity of carbonate has been formed. A number of other processes are employed to facilitate the manufacture of white lead more cheaply, but this process is employed as the most suitable for obtaining a fine quality. White lead is used extensively in painting, not only white, but many shades of color are added to it to produce the desired effect.

WHITE MOUNTAINS, a mountain chain of New England, which is situated chiefly in New Hampshire and belongs to the Appalachian highlands. It extends from eastern Maine nearly across New Hampshire, but assumes the greatest heights and largest extent in the latter State. Mount Katahdin, north of Millinoket Lake, is the highest elevation of eastern Maine, height 5.385 feet, and Mount Washington, height 6,288 feet, is the most elevated peak of the mountain group. The latter is situated in north central New Hampshire and is noted as a favorite resort for summer visitors. A mountain railway, consisting of three rails, was built to the summit of Mount Washington in 1869. A station of the Federal weather bureau and a hotel are located at the summit. Many villas and hotels are maintained in the vicinity for the accommodation of tourists.

The western part of the White Mountains is known as the Franconia Mountains. It contains Mount Lafayette, whose summit is 5,270 feet high, and a number of others which exceed 4,000

feet, including Profile, Liberty, and Moosilaukee mountains. A celebrated natural feature of Mount Profile, consisting of three projecting rocks, resembles a human profile and is known as the Old Man of the Mountain. Hawthorne based his beautiful allegory "The Great White Face" on this phenomenon. The summits of the White Mountains are generally rocky and bare, but fine forests originally covered the slopes.

WHITE PLAINS, a town in New York, county seat of Westchester County, 22 miles northeast of New York City, on the New York Central Railroad. It is surrounded by a fertile farming and dairying region. The features include the public library, the high school, and many attractive residences. It is the seat of Alexander Institute and the Bloomingdale Insane Asylum. White Plains is noted as the scene of a battle in the Revolution, which occurred Oct. 28, 1776. The place was held by the Americans under Washington and was attacked by the British under Howe, who came from New York with the view of breaking the blockade by getting in the rear of the American position. Though the latter obtained possession of an unimportant outpost, Washington held the grounds commanding White Plains until in November, when Howe fell back to Dobbs Ferry and Washington removed his troops to New Jersey. The place was incorporated as a town in 1788. Population, 1905, 11,579; in 1910, 15,949.

WHITE RIVER, a stream of Indiana, formed by two branches near the castern boundary of the State, near the border of Pike County. It has a general course toward the southwest until it joins the Wabash opposite Mount Carmel, Ill. From the junction of the two branches to its mouth is a distance of 50 miles. The entire length, including the West Fork, is 350 miles. Indianapolis is the chief city on the West Fork.

WHITE RIVER, a river of the United States, which rises in the Ozark Mountains of Arkansas and flows into the Mississippi near the mouth of the Arkansas River. It first courses toward the northeast, making a large curve through Missouri, but most of its course is toward the southeast. The White River is 800 miles long, of which 350 miles are navigable. The Black River, which rises in southern Missouri, is its chief tributary. A large portion of the White River valley is fertile, producing cereals, cotton, tobacco, grasses, and fruits.

WHITE SEA, an inlet from the Arctic Ocean, in northern Russia, sometimes called the Gulf of Archangel. It extends inland for a distance of 380 miles, varies in breadth from 30 to 150 miles, and comprises an area of 46,500 square miles. The Gulf of Kandalasksha is in the northwestern part and Onega Bay is in the southwestern part. The coast line, which embraces 975 miles, 18 largely precipitous. Into it flow the Mezen, Dvina, Onega, and Wyg rivers.

Though the surface is frozen from October to May, it is important for commercial purposes and contains excellent cod and herring fisheries. The navigation is connected by canals with the Volga and Dnieper, thus bringing it into direct communication with the Black and Caspian seas.

WHITING (hwit'ing), a fish closely related to the cod tribe, but differing from it in not having a barbel on the lower jaw. The body is moderately long and covered with small scales, the upper jaw protrudes, and the mouth is deeply cleft. It is usually from twelve to sixteen inches long and weighs from one to three pounds. The whiting is abundant in the seas of Northern Europe and is taken in large numbers off the shores of Great Britain. The name whiting is often applied to the hake and the kingfish of North America.

WHITMAN (hwit'man), a town of Massachusetts, in Plymouth County, twenty miles southeast of Boston, on the New York, New Haven and Hartford Railroad. The streets are regularly platted. It has a public library, waterworks, electric lighting, and a number of fine schools and churches. The manufactures include boots and shoes, hardware, wire nails, clothing, and machinery. Originally it was a part of Abington, but it was incorporated as South Abington in 1875, and the present name was adopted in 1886. Population, 1910, 7,292.

WHITMAN, Charles Otis, zoölogist, born in Woodstock, Me., Dec. 14, 1842. He graduated at Bowdoir College in 1868 and subsequently at the University of Leipsic, and in 1880 was made professor of zoology at the Imperial University of Tokio Japan. From 1883 to 1885 he was assistant in zoölogy at Harvard University, from 1886 to 1889 was director of the Allis Lake Laboratery at Milwaukee, and from 1890 to 1892 professor of zoölogy at Clark University. He was made professor of zoology in the University of Chicago in the latter year, in which position he did much to extend knowledge in particular lines of embryology and the anatomy of fishes. His publications include "The Seat of Formative and Regenerative Energy," "Evolution and Epigenesis,' "The Kinetic Phenomena of the Egg During Maturation and Fecundation," "Animal Behavior," and "Methods of Research in Microscopical Anatomy and Embryology."

WHITMAN, Walt, poet, born in West Hills, Long Island, N. Y., May 31, 1819; died in Camden, N. J., March 25, 1892. He had a public school education and began life as a printer, but taught in the common schools during the winter months. In 1847 he started on an extensive tour of the United States and Canada, and traveled hundreds of miles by boats on the great rivers. Subsequently he founded the New Orleans Crescent and in the Civil War ministered to the wants of the wounded and sick soldiers of both armies in the vicinity of Washington and in Maryland. The remarkable en-

ergy with which he attended to those needing care exhausted his strength and finally ruined his health.

Whitman was stricken with paralysis while



WALT WHITMAN.

at Washington, in 1873, where he had been employed as a clerk for many years. Shortly after he removed to Camden, where he made his home until his death. "Leaves of Grass," a series of poems devoted to social, moral, and political problems, is the chief work of Whitman and first ap-

peared in 1855. Some critics highly laud his poetical writings, while others condemn them with equal strength. It is possible that his admirers are a little too enthusiastic in his praise, but it is altogether certain that the unfavorable criticism of him is too severe. The writings of Whitman are apparently attracting more attention at present than ever before, and in a number of cities growing Walt Whitman societies are maintained. His writings embrace "Specimen Days and Collect," "November Boughs," "Democratic Vistas,"
"Drum-Taps," "Two Rivulets," "Passage to India," "As Strong as a Bird on Pinions Free," "Sands at Seventy," and "After All Not Only to Create."

WHITNEY (hwit'ni), Adeline Dutton Train, author, born in Boston, Mass., Sept. 15, 1824; died March 20, 1906. She was a sister of George Francis Train and in 1843 married Seth D. Whitney of Milton, Mass., where she resided permanently. Her writings are numerous, including about twenty volumes, and they furnish pleasant and wholesome reading. Among her leading books are "Mother Goose for Grown Folks," "Sights and Insights,"
"The Other Girls," "The Gayworthys," "A Golden Gossip," and "Friendly Letters to Girl Friends."

1

WHITNEY, Asa, manufacturer, born in Townsend, Mass., Dec. 1, 1791; died in Philadelphia, June 4, 1874. His education was limited, being employed a large part of his time in the blacksmith shop of his father, but he became an expert machinist by the time he attained his majority. He was engaged for a number of years at Brownville, N. Y., where he managed an extensive machine business, and in 1839 was elected canal commissioner of New York. In 1842 he removed to Pennsylvania, where he joined Matthew W. Baldwin in the manufacture of locomotives, and later founded a car-wheel factory. He patented a process to anneal car wheels, in 1848, and it may be said that his invention marks an important era in railroad construction. Whitney was president of the Reading Railroad for some time. He made many contributions to charitable and educational institutions, among them a gift of \$50,-000 to the University of Pennsylvania, \$20,000 to the Old Men's House in Philadelphia, and \$12,500 to the Franklin Institute.

WHITNEY, Eli, inventor, born in Westborough, Mass., Dec. 8, 1765; died in New Haven, Conn., Jan. 8, 1825. His desire to ob-

tain an education was gratified by attending Yale University, but not without considerable personal effort to secure the necessary money to support himself. The expenses were paid by teaching school and working at odd jobs during vacations, but he finally grad-



ELI WHITNEY.

uated in 1792 and afterward taught school in Georgia. While in the South he was assisted by the widow of General Greene, an officer of the Revolutionary War, thus enabling him to pursue the study of law. Whitney observed that the process of separating the cotton from the seed by hand was slow and expensive and accordingly undertook to invent a machine that would do the work. Since he was limited in means, he was obliged to make his own tools and prepare much of the material at a disadvantage. When his machine was about completed, some one broke into his workshop and stole his devices, thus enabling others to copy them and get machines made before he could have his own invention patented.

In 1793 Whitney finally completed the cotton gin and was voted a fund of \$50,000 by the State of South Carolina to develop its manufacture. Though the invention of the cotton gin was one of the most important connected with the cotton industry, he secured little profit, since he was obliged to defend his rights by many expensive lawsuits against the claims of others. The government gave him a contract for the manufacture of firearms and he established himself at Whitneyville, Conn., where he made a fortune by adapting ingenious machinery for manufacturing the different parts of firearms. It may be said that he was one of the first American manufacturers to take advantage of the division of labor, thus securing the benefits resulting from the application of skill to the parts most effectually made by each laborer. Macaulay said of him, "What Peter the Great did to make Russia dominant, Eli Whitney's invention of the cotton gin has more than equaled in its relation to the power and progress of the United States.'

WHITNEY, William Collins, public man, born at Conway. Mass., July 5, 1841; died Feb. 2, 1904. He studied at Yale University and at the Harvard Law School and in 1865 began to practice law in New York City. In 1872 he was made inspector of the city schools and three years later became corporation counsel. In city politics he opposed the "Tweed Ring." President Cleveland appointed him Secretary of the Navy in 1885, in which position he promoted the movement to construct larger vessels for the navy. In 1892 he managed the campaign for the Democratic party. Subsequently he was identified with numerous financial projects and enterprises in New York.

WHITNEY, William Dwight, philologist, born in Northampton, Mass., Feb. 9, 1827; died June 7, 1894. He was a brother of Joshua D. Whitney (1819-1896), the geologist, and was educated at Williams College, Williamstown, and at Yale University. In 1850 he went to Germany, where he studied Sanskrit and other languages in Berlin and Tübingen, and in 1854 became professor of Sanskrit in Yale University. He was made professor of comparative philology in that institution in 1870. Whitney had more than a national reputation as a writer and an expositor of the science of language. His chief works include "German Grammar," "Sanskrit Grammar," "Life and Growth of Languages," "German Reader," and "Oriental and Linguistic Studies." He was the chief editor of The Century Dictionary, published in 1891.

WHITTIER (hwĭt'tĭ-ēr), John Greenleaf, eminent poet, born near Haverhill, Mass., Dec. 17, 1807; died in Hampton Falls, N. H., Sept. 7, 1892. He was born



J. G. WHITTIER.

7, 1892. He was born on a farm near Haverhill. His parents were Quakers and he worked on the farm until he was eighteen years of age, but devoted all his leisure time to reading and study. His education was limited to the schools of the country district and two years' study at the Haverhill Academy. In the meantime he learned

the shoemaker's trade, but early devoted himself to writing for various periodicals. In 1830 he became editor of the New England Weekly Review, a newspaper at Hartford, Conn., but two years later returned to his native town to edit the Haverhill Gazette. He removed to Philadelphia and became the editor of the Pennsylvania Freeman, but his office was burned by a mob in 1839, owing to his ardent support of the abolition cause.

Whittier was a leading influence in organizing the American Anti-Slavery Society at Phila-

delphia and by the excitement of the times was inspired to write many poems devoted to the antislavery cause, which he published under the title of "Voices of Freedom." In 1840 he settled at Amesbury, Mass., where he devoted himself to literature and to the position of corresponding editor of the Washington National Era. Many critics have spoken of Whittier as a born poet. Everything that he came in contact with seemed to have given him poetic inspiration. His style is like the man, plain, but strong. Although his verse is simple, yet its truthfulness and delicacy touch the higher sensibilities of the soul. A man of deep moral and religious convictions, he gave to the world gems of writings that, like himself, always influence for good. His best known and most admired productions include "Legends of New England," "Home Ballads," "Among the Hills," "Pennsylvania Pilgrims," "Songs of Labor and Other Poems," "Snow-Bound, a Winter Idyl," "Miriam, and Other Poems," "Hazel Blossoms," "Lays of My Home," "In War Time, and Other Poems," "Centennial Hymn," "Poems of Nature," "Moll Pitcher," and "Complete Poetical Works." His familiar poems include "Maud Muller," "The Barefoot Boy," "Among the Hills," "Barbara Frietchie," and "Telling the Bees."

WHITTINGTON (hwit'ing-tun), Sir Richard, mayor of London, born in Pauntley, England, about 1359; died in 1423. He was the son of Sir William Whittington, who lost his estate on account of political complications. In 1379 he was able to loan five marks, which he had saved by working for a merchant, and henceforth fortune smiled upon him. He was elected alderman of London in 1392 and was chosen mayor of the city four different times. In 1416 he became a member of Parliament and was subsequently knighted by Henry V. From personal savings he was able to make loans to Henry IV. and Henry V., the latter granting him a lien on

the customs of London as security.

WHOOPING COUGH (hoop'ing kaf), an infectious and convulsive cough which is sometimes epidemic among children, but frequently affects adults. It is accompanied by short and sudden acts of noisy expiration, followed by a long and whooping inspiration. Though it usually occurs but once in the life of an individual and generally during infancy, some persons are attacked two or more times. It is most frequent in the spring and autumn. The symptoms are similar to those of a severe cold and the cough peculiar to the affection appears at the end of five or six days, accompanied by a watery discharge from the nose and eyes, considerable feverishness, and oppressive feeling in the chest. The period is usually from three to four weeks, but in some cases it continues much longer, sometimes even two months. Ordinarily the disease is not dangerous, but it is sometimes complicated with bronchitis and pneumonia, when careful medical treatment is necessary. Severe cases are accompanied by spasmodic symptoms.

WHORTLEBERRY (hwûr't'l-bĕr-rỹ), the name of any plant of an extensive genus of shrubs, more commonly known as huckleberry, which see.

WICHERN (vǐk'ern), Johann Heinrich, philanthropist, born in Hamburg, Germany, April 21, 1808; died there April 7, 1881. After attending the public schools, he studied theology in Göttingen and Berlin, and in 1833 established near Hamburg a reformatory for children, known as the Rauhes Haus. It was opened with twelve inmates, but at present has 24 buildings and many hundreds of attendants. The institution is organized on the plan of the industrial schools of Canada and the United States, teaching the inmates the elements of an education along with various industries, such as agriculture, beekeeping, bookbinding, baking, shoemaking, tailoring, etc. In 1844 he established a monthly periodical, known as the Publication of the Rauhes Haus. Subsequently he was chief of the penal and correctional institutions of Prussia. He published "The Inner-Mission of the German Evangelical Church," "Our Songs," and "Festival-Book of the Rauhes Haus."

WICHITA (wich'i-ta), a city of Kansas, county seat of Sedgwick County, on the Arkansas River, 160 miles southwest of Topeka. It is on the Missouri Pacific, the Atchison, Topeka and Santa Fé, the Saint Louis and San Francisco, the Chicago, Rock Island and Pacific, and other railroads. The city is surrounded by a fertile farming and stock-raising country. The streets are paved substantially, lighted by gas and electricity, and traversed by an extensive system of electric railways. It has fine county buildings, many well-constructed public schools and churches, and a public library of 15,000 volumes. The county courthouse is a fine stone structure which cost \$200,000 and the city hall was erected at a cost of \$100,000. It is the seat of the Friends' University, Lewis Academy, a medical college, and a Catholic college. Other features include the Martha Washington Home, the Scottish Rite Masonic Cathedral, the Fairmont College, the Federal post office, and the Wichita and Saint Francis hospitals. Among the manufactures are flour, cigars, lumber products, clothing, machinery, ironware, and farming implements. Wichita has large packing establishments and is an important market for cereals, live stock, dairy products, and vegetables. It was settled in 1869 and incorporated in 1872. Population, 1904, 31,857; in 1910, 52,450.

WICHITA, a tribe of North American Indians, formerly resident in the portion of Oklahoma that lies between the Red and the Wichita rivers, including the region of the Wichita Mountains. According to tradition, they migrated north from Louisiana and settled in Arkansas, after which they crossed north to the

region lying beyond the Red River. In 1859 they were assigned to a reservation on the north side of the Wichita, in the vicinity of Anadarko, Okla. These Indians are industrious and became self-supporting soon after the Civil War. Many have intermarried with the whites.

WIDGEON (wij'ún), the name of a genus of river ducks, closely allied to the teal and the gadwall. The bill is shorter than the head. It is of equal width throughout and the tip is much rounded. The wings are long and pointed and the toes are fully webbed, but the hind one is lobed. Ten species have been described, nearly all of which are found in the colder regions and usually on the margin of rivers and lakes. The bald pate, an American species, is about 22 inches long and is found in Canada and the northern part of the United States, especially in Minnesota. In winter it migrates southward to the interior of the United States.

WIELAND (ve'lant), Christoph Martin, poet and novelist, born in Oberholzheim, Germany, Sept. 5, 1733; died Jan. 20, 1813. He was the son of a pastor, under whose direction he received a careful primary training. After spending several years at the school of Klosterbergen, near Magdeburg, he entered the University of Tübingen with the view of studying law, but most of his time was devoted to literature. In 1752 he published "The Nature of Things" under an assumed name and, after completing his college work, he settled as an advocate at Biberach. In 1769 he became professor of philosophy in the University of Erfurt, where he taught successfully until 1772, when he removed to Weimar as tutor to the young duke Charles

Augustus. While there he contributed to a num-

ber of periodicals, wrote many of his excellent romances and poems, and maintained a friendly

relationship with Goethe and Schiller. Wieland ranks among the most eminent authors of Germany. His writings are characterized by grace and harmony of expression and versification, and through him German poetry received many excellent additions. 'Oberon" is considered his greatest poem and still has a wide circle of readers, both in the original and the many translations that have been made. Other writings include "Impeachment of Love," "History of the Abderites,"
"Gods and Heroes," "Choice of Hercules," "Moral Tales," "Comical Stories," "Aristippus and Several of His Associates," and "Trial of Abraham's Faith." He published a monthly periodical called the German Mercury and made translations from Horace and Cicero. On the Wielandsplatz at Weimar is a fine bronze statue of him by Gasser.

WIESBADEN (vēs-bā'den), a city of Germany, in the province of Hesse-Nassau, 26 miles west of Frankfort-on-the-Main. It is situated two miles from the Rhine, at the foot of Mount Taunus, and has excellent railroad facilities. The city is the most fashionable and popular

watering place in Germany, receiving many thousands of visitors annually, and is supplied with extensive hotels. The streets are beautifully paved, have gas and electric lighting, and are traversed by a system of electric street railways. It has many beautiful buildings, including the palace, several fine Protestant and Roman Catholic churches, a library with 75,000 volumes, a synagogue of Moorish architecture, and the Kursaal, an extensive tavern. In the vicinity are numerous saline springs, some cold and others warm. The Kochbrünnen are the most remarkable, having a temperature of 156° The Romans were acquainted with the springs of Wiesbaden and near the place are remains of baths, walls, and a military station of Roman construction. The city is supported quite largely by summer visitors, but has large manufacturing interests and a considerable trade in produce and merchandise. Population, 1905, 100,953; in 1910, 109,033.

WIGAN (wig'an), a city of England, in Lancashire, eighteen miles northeast of Liverpool. It is on the Douglas River and is surrounded by a rich farming and coal-producing region. The city has connections by a number of railways and canals. Among the chief buildings are the All Saints' Church, the Albert Edward Infirmary and Dispensary, and a number of fine public schools and churches. It has modern municipal improvements, such as pavements, waterworks, a public library, and rapid transit by electric railways. A beautiful park of 27 acres is the chief place of recreation in the summer time. The manufactures include machinery, cotton and woolen goods, hardware, chemicals, spirituous liquors, railway cars, paper, and engines. Wigan was a station during the Roman occupation. Population, 1911, 89,171.

WIGGIN (wig'gin), Kate Douglas. See Riggs, Kate Douglas Wiggin.

WIGHT (wit), Isle of, an island in the English Channel, which is separated from the mainland by the Solent and the Spithead, forming a part of the county of Hants. The length from east to west is 23 miles; breadth, thirteen miles; and area, 146 square miles. Much of the surface is elevated, but it is diversified with hills and dales. The island has long been noted for its beautiful scenery and interesting geology. It is visited by many tourists. The chief streams are the Medina, Yar, and Brading. Along the southern coast is the district known as the Under Cliff, where several hospitals are maintained for invalids. It has manufactures of cement and considerable shipbuilding. Sheep raising and fruit and vegetable culture are pursued with success. Newport is the government center. Other towns include Yarmouth, Ventnor, Cowes, Freshwater, and Bembridge. Several railroads and electric car lines are in successful operation. It has a number of landmarks dating from Roman occupation, chiefly near Brading. Carisbrooke Castle, in which

Charles I. was imprisoned for some time, is an interesting ruin. Population, 1911, 88,193.

WIGWAM (wig'wom), the name applied to a house built by the Indians of North America, especially one made of bark or matting in the form of a hut or cabin. Such a structure is built with a framework of saplings or small trees, which are set in the ground and converge at the top, where an opening is left for the escape of the smoke. Some tribes covered the framework with skins, while others used bark or braided mats of grass. In winter a fire was built in the center of the tent and mats were laid near the walls to serve as places to rest and sleep.

WILBERFORCE (wil'ber-fors), Samuel, clergyman, born at Clapham, England, Sept. 7, 1805; died July 19, 1873. He was a son of William Wilberforce, studied at Oriel College, Oxford, and in 1826 took orders in the Church of England. For some years he was rector of Brixton, Isle of Wight, and later preached before the University of Oxford. In 1845 he was made Bishop of Oxford and became lord high almoner to the queen. Although an opponent of ritualism, he was a leader of the High Church party. His wit and versatility in giving opinions caused him to be called Soapy Sam. Among his leading books are "Heroes of Hebrew History," "Sermons Preached Before the University of Oxford," "Note-Book of a Country Clergyman," and "A History of the Protestant Episcopal Church in America."

WILBERFORCE, William, philanthropist, born in Hull, England, Aug. 24, 1759; died July 29, 1833. He was educated at Cambridge University, where he excelled as a student, and in 1780 became a member of Parliament. In 1783 he joined Pitt in making a tour of France, where he studied the public institutions, and in 1784 was reëlected to Parliament for Yorkshire. While at Nice in the same year he was converted to the evangelical faith, after which he became devoted to the leading social and governmental reforms. About the same time he formed the acquaintance of Thomas Clarkson and joined him in the agitation against the slave trade. He advocated a law against permitting the further importation of African slaves into British colonies, which was finally adopted in 1807, and then began the agitation in favor of the total abolition of slavery. He was elected a vice president of the Anti-Slavery Society, formed in 1823, but retired from public life before the Emancipation Bill was passed, an event which took place shortly after his death. Wilberforce was not only active as an advocate of the liberation of slaves, but promoted many social and religious reforms. He was buried in Westminster Abbey, where a monument was erected to his honor.

WILCOX (wĭl'kŏks), Ella Wheeler, authoress, born in Johnstown Center, Wis., in 1855. She attended the public schools of Windsor and afterward pursued a course at the University of Wisconsin. In 1884 she was married to Robert M. Wilcox, of Meriden, Conn., and three years later removed to New York City. She became a frequent contributor to magazines and other



ELLA WHEELER WILCOX.

periodicals while she was at the university. In 1872 she published her first volume of poems under the title "Drops of Water." She not only contributed largely to American literature, but became a leading figure as a speaker and an advocate of woman's rights. Many of her short essays and criticisms were published in the New York Journal,

3147

the Chicago American, and other editions of the Hearst newspapers. Among her best known writings are "Poems of Pleasure," "A Double Life," "Poems of Passion," "Maurine," "Three Women," "An Ambitious Man,"
"A Woman of the World," "Every-Day Thoughts," "The Kingdom of Love," "The Beautiful Land of Nod," and "An Erring Woman's Love."

WILD CAT, or Catamount, the general name given to several species of wild animals. The common wild cat of Europe formerly inhabited all parts of the continent, except the sections of the extreme north, and is still found in some of the forests and mountains. It is larger than the domestic cat and has a shorter and thicker tail. The limbs and body are longer and larger. This animal is supposed to be the source of many species of the domestic cat. The name wild cat is applied to the jungle cat of India, the chati or margay of Mexico, and the lynx of North America.

WILDE, Oscar Fingal O'Flagertie, author, born in Dublin, Ireland, Oct. 16, 1856; died Nov. 30, 1900. He studied at Trinity College, Dublin, and Magdalen College, Oxford, and in 1879 removed to London, where he became known for his interest in aesthetics. In 1895 he was arrested in London for gross offenses against society and was soon after sentenced to the penitentiary for two years, which caused him to be barred from society. Among his writings are "Lord Arthur Saville's Crime and Other Stories," "Guido Ferranto," "The Importance of Being Earnest," "The Duchess of Padua," and "The Picture of Dorian Gray."

WILEY, Harvey Washington, chemist, born at Kent, Ind., Oct. 18, 1844. He became State chemist of Indiana in 1881, serving until 1883, and was long a professor at Columbian University. Later he instructed at George Washington University and was chief chemist of the United States Department of Agriculture. He published "Principles and Practices of Agricultural Chemistry."

WILDERNESS, Battles of the, the name of a series of battles in the Civil War of America, sometimes spoken of collectively as the Battle of the Wilderness. It is so named from the general character of the region in which the contests occurred, where the vicinity was characterized by swamps and thickets of pine and scrub oak. General Grant had an army of 120,000 men and was supported by Meade, Hancock, and Burnside, while the Confederates under General Lee numbered about 80,000 men. The Federals crossed the Rapidan River on pontoons on the night of May 3, 1864, under the immediate command of General Burnside, and took a position at the margin of the Wilderness.

Lee anticipated the movement undertaken by Grant and began the attack early in the morning of May 5. The Confederates fully understood the locality, thus placing the Federals at some disadvantage in the almost impenetrable forests, which made it necessary to confine the fighting to musketry at close range. General Warren carried the brunt of the battle during the day, while the Confederates were led by General Ewell, and the day ended without little advantage to either side. In the meantime Grant ordered Hancock to move upon the scene from Chancellorsville, while he engaged the Confederates under General Hill in a drawn battle. Lee summoned Longstreet to reinforce Hill and by joint action attempted to force the Federals back across the Rapidan, but the hostilities ended on the approach of night. While neither side gained material advantage, the Confederates were unable to advance farther and the Federals failed to progress toward Richmond. The contest of two days in the Wilderness caused a loss of 11,400 men by the Confederates and 15,387 men by the Federals. A few days later occurred the Battle of Spottsylvania Court House.

WILHELMINA (vĭl-hĕl-mē'nà), Paulina Marie, Queen of the Netherlands, born in The Hague, Aug. 31, 1880. Her father, Wil-

liam III., died in 1890, when she succeeded to the throne under the regency of her mother, Emma, the second wife of William III. and a daughter of Prince George Victor of Waldeck. The Salic law had been in force up to 1888, thus precluding female descendants from the throne, but her father succeeded in securing



QUEEN WILHELMINA.

its annulment, thus insuring the right of succession to his daughter. She received a liberal and classical education under the guidance of her mother and became accomplished in music and painting. Besides her own tongue, she acquired ability to speak fluently the German, French, and English. On Aug. 31, 1898, she attained to the age of eighteen years and according to the law of Holland became of legal age to assume full government. At that time she issued a proclamation expressing her gratitude for the loyalty of her people and her readiness to assume the responsibilities of actual sovereignty. She was officially enthroned in the Nieuwe Kerk, Amsterdam, on Sept. 6, 1898, amid great rejoicing. Her administration proved remarkably popular with the people. In 1901 she married Duke Henry Frederick of Mecklenburg-Schwerin, an officer in the German army, the occasion being celebrated with remarkable interest as a national holiday.

WILKES (wilks), Charles, naval officer, born in New York City, April 3, 1798; died in Washington, D. C., Feb. 8, 1877. He entered the navy in 1816 and three years later was sent to the Mediterranean, where he continued in the service until ordered to the Pacific, in 1821. After serving continuously until 1830, he was appointed to take charge of a department in the depot of charts and instruments at Washington, where he made the first astronomical observations in the United States by means of fixed instruments. In 1838 he was appointed to command an exploring expedition to the Samoan Islands, in the Pacific, and while on this tour explored the Fiji group and discovered many islands in the Antartic Ocean. He was made a captain in 1855 and in 1861 was given command of the United States steamer San Jacinto. While serving in that capacity he seized Mason and Slidell, who were sailing on the British mail steamer Trent as commissioners of the Confederate States to England and France, and removed them as captives to Boston. Although he received the thanks of Congress, the government finally released the prisoners at the demand of the British government, this incident being known as the Trent Affair. He was promoted to the rank of commodore in 1862 and at the close of the war was placed on the retired list. He published "Theory of the Winds," "West-ern America," "Meteorology" and "Hydrography."

WILKES, John, public man, born in London, England, Oct. 17, 1727; died Dec. 27, 1797. He studied at the University of Leyden, in the Netherlands, and spent some time in travel on the continent. In 1757 he was elected to Parliament for Aylesbury and soon became a fighter against the government. He published a paper entitled the North Briton, in which he severely criticised the speech made by the king to Parliament, for which he was arrested and committed to the Tower. Some technicality caused the prosecution to fail, but he was expelled from the House of Commons in 1764 and soon withdrew to France. Four years later he returned

to England and was again elected to Parliament, but he was not permitted to serve, although the constituency of Middlesex elected him three times in succession. This gave rise to an extensive agitation known as Wilkes and Liberty. In 1770 he was set at liberty and became an alderman of London. The following year he was elected sheriff of London, of which city he became lord mayor in 1774. In the same year he was again elected to Parliament and permitted to serve. The long contest of Wilkes for a seat in that body established the precedent under which each constituency is accorded the right to choose its representative without interference of the Parliament.

WILKESBARRE (wilks'băr-ri), a city of Pennsylvania, county seat of Luzerne County, 142 miles northwest of Philadelphia. It is on the Susquehanna River, which is crossed by four bridges, and on the Lehigh Valley, the Pennsylvania, the Delaware, Lackawanna and Western, and other railroads. Electric railways furnish communication within the city and to many other commercial centers and inland points, including the Laurel line to Scranton, one of the finest three-rail lines in the country. The site is a beautiful tract of land overlooking the river, and the surrounding country produces large quantities of anthracite coal.

The streets are regularly platted and well improved by pavements of stone and macadam. Among the principal buildings are the county courthouse, the Osterhout free library with 35,000 volumes, the Wyoming historical museum, the Grand Army hall, the Young Men's Christian Association, and many fine business blocks. It has a thoroughly organized system of public schools, which terminates in an extended high school course. The city has several theaters, a number of fine hotels, and many well-constructed ecclesiastical buildings. Many of the streets are ornamented with shade trees, especially in the residential section, and the city maintains its waterworks and sewerage systems.

Wilkesbarre is important as a manufacturing and commercial center. The coal produced in the vicinity has been instrumental in building up vast industrial enterprises. Among the establishments are the machine shops of the Lehigh Valley Railway, breweries, flour and grist mills, cutlery works, and manufactories of silk and cotton goods. It produces large quantities of locomotives, clothing, automobiles, underwear, and machinery. The first settlement in the vicinity was made in 1769. In 1778 it was the scene of a conflict between the Americans and the Loyalists and Indians, on account of which the Wyoming Monument has been erected. It was made the county seat in 1786, incorporated as a borough in 1806, and chartered as a city in 1871. Many towns and boroughs of considerable size are located in the vicinity. Population, 1900, 51,721; in 1910, 67,105.

WILKIE (wil'ki), Sir David, painter, born

in Cults, Scotland, Nov. 18, 1785; died at sea off Gibraltar, June 1, 1841. An early inclination for art caused him to become skilled in drawing at school. He entered the Trustees' Academy at Edinburgh in 1799 to study art. His first notable painting is a subject picture entitled "Pitlessie Fair," which he completed on returning to Cults in 1804. It includes 140 figures, among which are several members of his family and a number of neighbors. In 1805 he established a studio in London and soon after became a member of the Royal Academy. Many of his paintings have been engraved. Some critics have placed his pictures in rank with the fiction of Scott and the poetry of Burns. The honor of knighthood was conferred upon him in 1836. His health gave way on account of close confinement to work. He sought to restore it in 1840 by making a trip to Palestine and Egypt, but died on his return voyage. His best known paintings include "The Village Politicians," "Callisto in the Bath of Diana," "Columbus in the Convent at La Rabida," "Empress Josephine and the Fortune Teller," "Napoleon and Pius VII. at Fontainebleau," "Queen Victoria Presiding at Her First Council," "The Maid of Saragossa," "John Knox Preaching Before the Lords of the Congregation," "Cotter's Saturday Night," "Sir David Baird Discovering the Body of Tippoo Sahib," and "Chelsea Pensioners Reading the Gazette of Waterloo.

WILKINSBURG (wil'kinz-bûrg), a borough of Pennsylvania, in Allegheny County, six miles east of Pittsburg, with which it is connected by electric railways and the Pennsylvania Railroad. The surrounding country produces large quantities of coal. Among the features are the Home for Aged Protestant Women, the public library, the high school, and the Presbyterian Home for the Aged. The manufactures include machinery, hardware, cigars, furniture, and clothing. It was formerly known as Rippeyville, but was given its present name in honor of William Wilkins, Secretary of War under President Tyler. Population, 1910, 18,924.

WILKINSON (wil'kin-sun), Henry Spenser, author and journalist, born at Manchester, England, May 1, 1853. He was educated at Owens College, Manchester, and at Merton College, Oxford, and in 1880 was admitted to the bar at Lincoln's Inn. Soon after he became connected with the Manchester Guardian, with which he continued until 1892, and subsequently was made a member of the staff of the London Morning Post. He traveled in India in 1892, visiting the Khyber Pass and many points of interest in the Punjab. His advocacy of a larger army and navy for Great Britain attracted much attention, and during the Boer War of 1899-1900 he increased his popularity by forecasting the military movements and their results of both British and Boers. Among his chief writings are "Essays Toward the Improvement of the Volunteer Forces," "Essays on the

War Game," "Command of Artillery in the Army Corps and the Infantry Division," "The Great Alternative, a Plea for a National Policy," "The Nation's Awakening," "The Brain of an Army," "War and Policy," and "The British

Policy in South Africa."

WILKINSON, James, soldier, born at Benedict, Md., in 1757; died Dec. 28, 1825. He studied medicine, but entered the Continental army in 1778 and served in Canada and at Saratoga under Gates. His implication in the Conway Cabal caused him to resign from the service. After the close of the war he emigrated to Kentucky, where he became implicated in an attempt to transfer that region from the United States to Spain. In 1791 he was reinstated in the army for service against the Indians, and five years later succeeded General Wayne as commander in chief. President Jefferson appointed him Governor of Louisiana in 1805 and the following year he disclosed the scheme of Aaron Burr to found an empire in the Southwest. Although implicated in the conspiracy, he was acquitted after being court-martialed. In the War of 1812 he cooperated with General Hampton, but was discharged from the service on account of inability. Soon after he removed to Mexico, where he resided until his death.

WILL, in law, the disposition of a person's property to take effect after death. The term will is more strictly applied to the disposal of real property, while the word testament has reference to the disposition of personal property. The words last will are usually employed in documents that dispose of real property, while the expression last will and testament refer to the disposal of both real and personal property. In order to have testamentary capacity, that is, to be able to dispose of property either by a will or a testament, it is necessary that the person be of full age and sound mind. In most countries this right is vested in females who have reached their majority and in married persons of both sexes, even if they have not reached full age. A will must be in writing, be signed by the testator or some one acting in his presence and by his direction, and be witnessed by two persons who are present at the time and not beneficiaries by the will. The testator may name one or more persons as executors to see that the provisions of the will are carried out, but in the absence of such an appointment the court names the executor.

A codicil is an addition to the will. Both the will itself and one or more codicils, to render them inoperative, may be canceled or destroyed by the testator, or a document to revoke the will may be duly executed in the presence of two witnesses, who must sign the same. If several wills are in existence, the one of latest date takes precedence, but, if it is revoked, the one prior is thereby revived. The custodian of a will files the same in the probate court after the death of the testator, where it is admitted to

probate and is afterward duly recorded. In most countries personal property can be disposed of by will verbally in the presence of witnesses, though the value is usually limited to

WILL, in mental science, one of the three faculties of the mind, which include intellect, sensibility, and will. The will is the faculty by which we choose and execute, or, as defined by some writers, the power of choice and volition. A completed act of the will embraces the choice of an aim or object and the putting forth of energy to accomplish that aim, or attain that object. Thus, a choice is more than a mere preference between two courses of action. It may be said to constitute the choice of an object to which the activity is to be directed. To what extent the will is free in making a choice has been a subject of controversy for ages. Philosophers in all epochs of learning have discussed the relation between will and motive, but it has never been authoritatively settled whether the will determines the motive or the motive governs the will. On the one hand we have those who maintain a theological and metaphysical belief in the freedom of the will, while others assert that will action is the result of necessity. Aristotle asserted the freedom of the will in his ethics and was supported in that view by the Stoics, the Epicureans, Origen, and Saint Augustine. Many modern writers, among them Kant and Hamilton, have supported the view that the action of the will is unrestrained. The Gnostics denied the freedom of the will, as also did many early Christians, Spinoza, and Hume. That the will can be effectually trained is apparent, its right culture depending upon right use. The training of this faculty depends upon allowing the child to exercise the will within reasonable limits, but the learner is to be held responsible for the consequences attending its free exercise.

WILLAMETTE (wil-lä'mět), a river in Oregon, which rises in the Calapooia Mountains, a range of the Cascades, and after a general course toward the north enters the Columbia near Portland. It has a total length of 258 miles and is navigable for 150 miles. Canal and locks are maintained to avoid the falls at Oregon City and Eugene. The Willamette valley is the most densely populated part of Oregon. Among the chief tributaries of the Willamette are the Yamhill, Santiam, Calapooia, and Mc-Kinzie rivers. Portland, Salem, Albany, Oregon City, and Eugene are the principal towns on the Willamette.

WILLARD (wil'lerd), Emma Hart, educator, born at Berlin, Conn., Feb. 23, 1787; died April 15, 1870. She studied at the academy in her native village, where she became a teacher in the public schools. Three years later she was chosen principal of an academy for girls at Middlebury, Vt., where she married Dr. John Willard in 1809. Soon after she established a

boarding school for girls and made it an instrument to promote higher education among women. In 1821 the school was removed to Troy, N. Y., where it was incorporated as the Troy Female Seminary. Later she aided in founding a school for girls at Athens, Greece, and promoted the cause of higher education among women by lecturing and writing. A statue of her was unveiled in Troy, N. Y., in 1895. Her books include "History of United States," "Treatise on the Circulation of the Blood," "Willard Geog-raphies and Atlases," and "Last Leaves of American History." She is the author of the poem "Rocked in the Cradle of the Deep."

WILLARD, Frances Elizabeth, lecturer and reformer, born in Churchville, N. Y., Sept. 28, 1839; died in New York City, Feb. 18, 1898.

Her parents removed to Wisconsin and thence to Evanston, Ill., in 1858, where she graduated from the Northwestern University. After teaching in the public schools for several years, she became a teacher in the Northwestern University and from 1868 to 1870 traveled in Europe FRANCES E. WILL



and the East. She was president of the Woman's College in Evanston from 1871 until 1874, where she first showed her extraordinary ability as an organizer and leader. Besides contributing to a number of magazines and other periodicals, she became known as an effective speaker and for many years her energy seemed to be almost boundless. For ten years she averaged one address daily before a public meeting and spoke in nearly every city of 10,000 or more inhabitants in the United States. While on her tours, she was accompanied by Anna Gordon and not only devoted herself to speaking, but wrote many articles for newspapers and magazines. In 1892 she became editor of the Union Signal, the official organ of the Woman's Christian Temperance Union, which she continued to edit until the time of her death. Miss Willard became corresponding secretary of that organization in 1874, president of the National Union in 1879, and chief executive officer of the World's Union in 1888. Her writings include "Glimpses of Fifty Years," "Woman and Temperance," "How to Win," "Nineteen Beautiful Years," "A Great Mother," and "Woman in the Pulpit."

WILLIAM (wil'yam), Prince of Orange, surnamed The Silent, born at the palace of Dillenburg, in Nassau, April 16, 1533; assassinated in Delft, July 10, 1584. He was the eldest son of William, Count of Nassau, who was a zealous Lutheran, but was brought up nominally as a Catholic at Brussels. In 1538 he became a page at the court of Charles V., who favored him on account of his many talents. In 1555 Charles V. transferred the Netherlands to his son, Philip

II., but the reckless persecutions of the Protestants caused William to turn against the Spaniards and in 1567 he retired to Germany. Although he had been brought up a Catholic, he declared himself a Protestant and raised a large army with which to expel the Duke of Alva from the Netherlands. He was forced to retire to French Flanders, where he joined the Huguenots under Coligny. Shortly after he invaded Brabant, organized a large number of privateers to harass the coast, and in 1572 was made stadtholder of Holland, Utrecht, Zealand, and Friesland by the estates, thus obtaining the necessary support to organize a powerful opposition to the Spanish.

The massacre of Saint Bartholomew in France temporarily checked the hopes of William of obtaining material aid from France, but he negotiated a treaty by which the provinces united to expel the Spaniards. The siege of Leyden was one of the important events of that period. The city had been surrounded by the Spaniards until it was almost starved into surrendering, but William saved it by breaking the dikes and letting in the sea to destroy the fortifications built by the Spaniards as defenses against the city. In 1579 he formed the union of Utrecht, by which Holland, Utrecht, Friesland, Zealand, Overyssel, Gronigen, and Gelderland became united, thereby founding the republic of the United Netherlands. united provinces declared themselves independent on July 26, 1581, and offered to make William the chief ruler, but he twice refused. Philip II. was so thwarted by the military successes of William that he set a price of 25,000 gold crowns upon his head, and the latter was finally assassinated by a Frenchman named Balthasar Gérard. At Dillenburg is a memorial tower, which was erected to his memory in 1875.

WILLIAM I., surnamed The Conqueror, King of England and Duke of Normandy, born at Falaise, Normandy, in 1027; died near Rouen, France, Sept. 9, 1087. His father, Duke Robert I. of Normandy, died in 1035 and several claimants contested the throne, but his guardians were able to maintain his rights until he reached manhood. Edward the Confessor, King of England, was his second cousin and the Norman influence at the English court had gained considerable strength during his reign. At the death of the latter, William claimed the throne of England, but the English objected to his pretensions and chose Harold, a Saxon, as king. He soon after invaded England with a powerful army from Normandy and at the Battle of Hastings, on Oct. 14, 1066, totally defeated the English under King Harold, who was slain in battle. His government was mild and considerate at first, but the conquered Saxons rose in open revolt in 1070 to expel the Normans and, after subduing the former, he treated them as a conquered nation.

William established the feudal system by granting large tracts of land to his nobles, garrisoned the fortresses with Normans, and insisted upon firm administration of law and justice. Scotland was invaded by him with a large army in 1072, when Malcolm Canmore, King of Scotland, was required to recognize Norman authority. In the later part of his reign he authorized a general survey of the lands and had records made of the various divisions, which are still found in the *Domesday Book*. In 1080 his son, Robert, commanded an army in an open war against him. William invaded France in 1087 because of the difficulties which arose on account of the King of France encouraging Norman nobles to engage in a rebellion. While in France he left his half-brother, Bishop Odo, to administer the government in England. The army under William the Conqueror captured Nantes and several other points, but he was injured by falling from a horse and died in the abbey of Saint Gervais, near Rouen. He was buried at Caen, in the Church of Saint Stephen, which had been erected by him in 1064.

WILLIAM II., surnamed Rufus, King of England, born in Normandy in 1056; died Aug. 2, 1100. He was the second son of William the Conqueror, whom he succeeded as King of England on Sept. 26, 1087. His elder brother, Robert, had rightly inherited the throne, but William hastened to England on hearing of the death of his father and was crowned at Westminster. His brother, then Duke of Normandy, was supported for the throne of England by the Norman barons and accordingly incited an insurrection, but William promptly invaded Normandy. After obtaining recognition as King of England, he expelled the Norman barons and confiscated their estates. Subsequently he invaded Scotland, put down insurrections in Wales, and made numerous internal improvements. He completed the Tower, erected Westminster Hall, and built the London Bridge. In 1091 he crossed into Normandy with an army, but made a conciliation with his brother, Robert, in 1096 by loaning him \$50,000 to accompany the Crusade to the Holy Land. As security or this loan he accepted a mortgage on Normandy. William was accidentally shot while hunting in the New Forest by Sir Walter Tyrrel. He was succeeded by his younger brother as Henry I.

WILLIAM III., Stadtholder of Holland and King of England, born in The Hague, Nov. 4, 1650; died in Kensington, March 8, 1702. He was a son of William II. of Nassau, Prince of Orange, and Mary, daughter of Charles I. of England. William was opposed by Cromwell in his rightful title to become stadtholder, and the government of the United Provinces was in the hands of John De Witt for some years. France and England declared war against the Netherlands in 1672, when an open revolt caused De Witt to be murdered, and William was declared captain general and stadtholder of the

United Provinces. When almost overpowered by the larger opposing army, William cut the dikes built by the Hollanders to prevent the sea from flooding their lands, thus compelling the allied armies to retire. The Treaty of Nimeguen finally restored peace in 1678, when Louis XIV. of France withdrew his hostile forces. William had married Mary, daughter of King James II. of England, in 1677, and thus came in position to exercise considerable influence. He curbed the power of Louis XIV. by stimulating the League of Augsburg, in 1686, and on Nov. 5, 1688, invaded England with a powerful army at the invitation of many leading citizens.

The people rallied to his support as soon as he reached the shore at Torbay, while James fled with his family to France, and William and Mary were proclaimed joint sovereigns on Feb. 13, 1689. Scotland almost immediately accepted the new conditions, but Ireland, being aided by an army under James, maintained the cause of the deposed king. However, their forces met defeat at Boyne in 1690 and at Aughrim in 1691, and they were finally compelled to submit. William next invaded France to punish Louis XIV., who had been championing the cause of James, but his army was defeated in a number of decisive battles and he was compelled to accept the Treaty of Ryswick, in 1697. Louis XIV. recognized William as King of England on the death of James, in 1701. William is classed among the ablest kings of England. Within the period of his reign material progress was made in the educational and industrial welfare of the people. He died from the effects of falling from his horse at the time when the War of the Spanish Succession was about to begin. William was courageous and persevering in business, liberal in theological opinions, and thoughtful in the administration of law.

WILLIAM IV., King of England and Ireland, born in London, Aug. 21, 1765; died June 20, 1837. He was the third son of George III., became a midshipman under Admiral Digby in 1779, and was made Duke of Clarence in 1789. On the death of the Duke of York, in 1827, he became heir apparent, and on June 26, 1830, succeeded his brother, George IV., to the throne. The events of his reign include the abolition of slavery in the colonies, the passage of the Reform Act, the reform of the poor laws, and extensive internal improvements. William married Adelaide of Saxe-Meiningen in 1818, but left no surviving children. He was succeeded by his niece, Queen Victoria, who was the daughter of Edward, Duke of Kent, fourth son of George III.

WILLIAM I., King of Prussia and Emperor of Germany, born in Berlin, March 22, 1797; died March 9, 1888. He was the second son of Frederick William III. of Prussia and was carefully educated. His training in military affairs was the most efficient obtainable in his time,

thus equipping him for the celebrated military and political successes that make his name famous in history. In 1813 he became a captain and accompanied Blücher in his campaigns against Napoleon from 1813 to 1815. The Iron Cross was awarded him for distinguished ser-

vices at Barsur-Aude. He was made major general in 1818, studied the military systems of several European countries, and in 1829 married Princess Augusta of Saxe-Weimar. His brother, Frederick William IV., ascended the throne



WILLIAM I.

Prussia in 1840, thus making William the heir apparent, and the latter commanded the forces that suppressed the revolution of 1849 in Baden. In 1858 he became regent, owing to the illness of his brother, and on Jan. 2, 1861, succeeded the latter on the throne of Prussia. He won great popularity by his success in building a sentiment of fellowship among the German states and by his eminent military achievements.

In 1864 William added the duchies of Schleswig and Holstein to Prussia by a successful war against Denmark, and in 1866 his military forces subdued those of Austria, ending in the famous victory of Sadowa. When Napoleon III. de-clared war against Prussia, in 1870, all the north German states rallied to his standard, and he personally accompanied his well-disciplined armies on the invasion of France. At the battles of Sedan and Gravelotte he had personal command, and afterward entered Paris at the head of the army. On Jan. 18, 1871, he was proclaimed Emperor of Germany in the palace of Versailles and was greeted with unbounded enthusiasm on his return to Berlin. His reign of 31 years witnessed remarkable industrial and commercial development in the German states. The success of his political and military career may be attributed to his calm judgment and his unsurpassed wisdom in choosing generals and statesmen to cooperate with him. Von Moltke is the greatest soldier of his time and Bismarck, the most eminent statesman. He was succeeded by his son, Frederick III. Many monuments have been erected to his memory. His moderation and calm statesmanship may be considered prominent factors in the success of modern Germany, both in its military and industrial development.

WILLIAM II., King of Prussia and Emperor of Germany, eldest son of Emperor Frederick III., born in Berlin, Jan. 27, 1859. After



WILLIAM II.

studying under private tutors at home. he entered the gymnasium of Cassel. Subsequent to graduating from that establishment, in 1877, he became a student in the University of Bonn. He married Princess Augusta Victoria of Schleswig - Holstein, Feb. 27, 1881, and on June 15, 1888, succeeded his father as emperor. Before the death

of his father he expressed opposition to the peaceful policy inaugurated by the latter and it was thought that his reign would be of a pronounced military character, but on ascending the throne he issued addresses of a pacific tone, in which he expressed the determination to maintain the existing peace and promote the national welfare. His first act of public policy was to visit the various courts of Europe to cement friendly relations. While on a visit to England, in 1893, he won the Queen's cup at the Cowes yacht race. His determination to be ruler in fact as well as in name caused Prince Bismarck to resign as chancellor of the empire in 1890. Other events of importance include the acquisition of Helgoland, the extension of colonial interests in Africa and the Pacific, the renewal of the Triple Alliance, and legislation favorable to the laboring and agricultural classes. He demonstrated a large interest in the dissemination of education, especially in the primary and elementary lines, and became noted as a patron of science. The policy pursued by his government materially widened the importance of Germany as a manufacturing and exporting country, two lines in which it now takes a high rank among the nations. He gave much support to the extension of education, railways, colonization, and commerce, and was prominent in the Great European War which began in 1914. His son, Frederick William, the crown prince, born in 1882, had an important command in the campaigns against France.

WILLIAM AND MARY COLLEGE, an institution of higher learning at Williamsburg, Va., founded in 1693. It is the second oldest institution of its kind in the United States. During the Revolution it suffered heavily through the loss of its endowments and much of its property was destroyed at the time of the Civil War, when the buildings were occupied by the Federal troops. It was again opened in 1869, but suspended instruction from 1881 until 1888,

owing to a lack of financial support. In 1893 Congress granted it an indemnity of \$64,000 for its losses during the Civil War, and in the meantime it received additional aid from the State. The courses include general normal and collegiate instruction. It has a library of 10,000 volumes, the property is valued at \$160,000, and it is attended by about 200 students. Among the eminent graduates are John Marshall, Winfield Scott, and Presidents Harrison, Jefferson, Monroe, and Tyler.

WILLIAMS, John, celebrated missionary, born at Tottenham, England, June 29, 1796; died in the New Hebrides, Nov. 20, 1839. He was apprenticed to an ironmonger in 1810 and acquired considerable skill as a mechanic, but subsequently became interested in missionary work. The London Missionary Society sent him to the South Sea Islands in 1816, with a station in the Society Islands, where he learned the native language and did extensive work in inducing the people to embrace Christianity and engage in civil arts. He visited many other islands and trained natives to do missionary work. In 1834 he returned to England, where he had the New

Testament printed in the Raratongan language,

and four years later returned to his missionary

work in the Society Islands and Australia.

While at Erromango, in the New Hebrides, he was assassinated by the natives.

WILLIAMS, John Sharp, public man, born at Memphis, Tenn., July 30, 1854. He studied at the University of the South, the University of Virginia, and in Heidelberg, Germany, and began to practice law in 1877. The following year he removed to Yazoo City, Miss., where he built up a successful law practice. In the meantime he became interested as a cotton planter. In 1892 he attended the Democratic national convention as a delegate, after which time he was a factor in other national conventions of that party. He was elected to Congress in 1892 and was reelected from time to time. He served on many important committees in the House, where he was the leader of his party for many years.

WILLIAMS, Roger, noted Puritan clergyman and founder of the colony of Rhode Island, born in London in 1604; died in Rhode Island in 1683. He graduated from Cambridge University and studied law, but later became a clergyman in the Anglican Church. Subsequently he joined the Puritans and in 1631 came to Massachusetts, where he was pastor in Plymouth and Salem. His pronounced views in favor of religious toleration and that the government and church should be separated caused him to be expelled from the colony. In 1636 he left Salem and in the same year founded Providence and established friendly relations with the Indians. The settlement was so named in remembrance "of God's providence to him in distress." He was publicly immersed in 1639 and became pastor of the First Baptist Church of Providence. Massachusetts began to claim jurisdiction over Narragansett Bay, hence Williams proceeded to England, in 1643, where he obtained an independent charter, and in 1649 was chosen deputy president. He made a second visit to England in 1651 in behalf of the settlers, and while there enlisted the friendship of Milton, Cromwell, and other prominent leaders of the Puritans. On returning to the colony, in 1654, he became its governor and served in that office until 1658. The religious freedom enjoyed in Rhode Island was due to him. He published "The Bloody Tenet of Persecution for Cause of Conscience," "Experiments of Spiritual Life and Health," and "Hireling Ministry None of Christ's."

WILLIAMS, Samuel Wells, historian and lecturer, born in Utica, N. Y., Sept. 22, 1812; died in New Haven, Conn., Feb. 16, 1884. He graduated at the Rensselaer Polytechnic Institute in 1832 and the following year went to China as a printer in the service of the American Board of Foreign Missions. For several years he assisted in editing the Chinese Repository. From 1853 to 1854 he was interpreter to Commodore Perry on his expedition to open Japan to the trade of the world. In 1862 he became secretary and interpreter to the United States legation in China, but returned to the United States in 1875 to accept a lectureship on Chinese literature and language in Yale University. He was president of the American Bible Society in 1881. His writings include "Chinese Commercial Guide," "Dictionary of the Chinese Language in the Canton Dialect," "History of the Middle Kingdom," and "Easy Lessons in Chinese." He translated the books of

Matthew and Genesis into Japanese. WILLIAMSBURG (wil'yamz-bûrg), a city in Virginia, county seat of James City County, on the James River, 48 miles southeast of Richmond. It is on the Chesapeake and Ohio Railroad. The features include the county courthouse, the Powder Horn building, the Bruton Parish Church, the Eastern State Hospital for the Insane, and the William and Mary College. It has manufactures of knit goods, brick, machinery, and lumber products. Fish, oysters, fruit, and farm produce are shipped from this place. It was settled in 1632 and became the capital of Virginia in 1698, supplanting Jamestown as the seat of government. Williamsburg was the scene of several battles in the Revolution and the Civil War. The Battle of Williamsburg, fought on May 6, 1862, was an engagement of the Peninsular Campaign, in which the Union army under Hooker was defeated by the Confederates under command of Longstreet and Magruder, the former losing 2,285 men and the latter 1,560. Jefferson, Randolph, Tyler, Monroe, Winfield Scott and Chief Justice Marshall are among the famous men who studied at Williamsburg. It was the Colonial and State capital until 1780. Population, 1910, 2,714.

WILLIAMS COLLEGE, an institution of higher learning at Williamstown, Mass., founded by charter in 1793. It is the outgrowth of a school established under the will of Ephraim Williams (1715-1755), an American soldier and pioneer. Mark Hopkins was its president from 1836 until 1872, under whose supervision it developed a high standing among the institutions of America. Students are admitted upon examinations or certifictes from accredited schools, and the courses lead up to the degrees of B. A. and M. A. It has property valued at \$450,000, an endowment of \$1,250,000, and a library of 85,000 volumes and pamphlets. The faculty consists of 60 instructors and it has an attendance of 450 students.

WILLIAMSPORT (wĭl'yamz-port), a city in Pennsylvania, county seat of Lycoming County, on the Susquehanna River, 93 miles north by west of Harrisburg. It is on the Erie, the Pennsylvania, the Philadelphia and Reading, and other railroads. The surrounding country is a rich farming and coal-producing region. It has a large trade in coal, lumber, and merchandise. The streets are regularly platted and finely improved by pavements, gas and electric lighting, electric street railways, waterworks, and several parks. Among the chief buildings are the county courthouse, the city hall, the Federal post office, the Masonic Temple, the Dickinson Seminary, and the Scottish Rite Cathedral. The manufactures include lumber products, clothing, boilers, cigars, rubber goods, sewing machines, furniture, and machinery. It was first settled in 1795 and was chartered as a city in Population, 1900, 28,757; in 1910, 31,860.

WILLIAMSTOWN, a town of Massachusetts, in Berkshire County, on the Hoosac and Green rivers, 22 miles north of Pittsfield. It is on the Boston and Maine Railroad and has communication by electric railways. The leading features include the Mission Park, the public library, and the Williams College. It is primarily a residential center, but has manufactures of boots and shoes, woolen goods, hardware, clothing, and carriages. Williamstown was settled in 1753 and called West Hoosac, but the present name was adopted in 1765 in honor of Ephraim Williams. Population, 1910, 3,708.

WILLIMANTIC (wil-li-man'tik), a city of Connecticut, in Windham County, on the Natchaug and Willimantic rivers, 30 miles east of Hartford. It is on the Vermont Central and the New York, New Haven and Hartford railroads. The Willimantic River has a fall of 100 feet in one mile, thus supplying an abundance of water power. The noteworthy buildings include the public library, the townhall, the Dunham Hall Library, and the State normal training school. Among the manufactures are cotton and silk textiles, woolens, linen thread, carriages, machinery, and farming implements. It has a growing trade in merchandise. The

place was settled in 1822, became a borough in 1833, and was incorporated as a city in 1893. Population, 1900, 8,937; in 1910, 11,230.

WILLIS (wil'lis), Nathaniel Parker, author, born in Portland, Me., Jan. 20, 1806; died July 20, 1867. He was the eldest son of Nathaniel Willis, a newspaper proprietor in Boston, and studied at the Andover Academy and Yale University, graduating from the latter in 1827. About that time he published "Poetical Sketches" and in 1829 founded the American Monthly Magazine, which was afterward merged with the New York Mirror. His most charming work is "Letters From Under a Bridge," published in 1840. Other well-known writings include "Inklings of Adventure," "Pencilings by the Way," "Dashes at Life," "Life Here and There," "People I Have Met," "Rambles and Adventures," "Famous Persons and Places," "Ghost Ball at Congress Hall," "Outdoors at Idlewild," "A Health Trip to the Tropics," and "A Life of Jenny Lind."

WILLISTON, county seat of Williams County, N. D., 115 miles west of Minot, on the Missouri River and on the Great Northern Railroad. It has a large trade in flour, lignite coal, and farm produce. The local and wholesale trade is extensive. Among the chief buildings are the courthouse, high school, and federal building. It was settled in 1870 and incorporated in 1903. Population, 1910, 3,124.

WILLOW, a class of shrubs or trees of the genus Salix, varying in size from shrubs of only a few inches in height to trees 40 to 75 feet high.



WEEPING WILLOW.

They usually grow by or near water courses and are confined almost entirely to the temperate and colder regions of the Northern Hemisphere. Many species have been described. The branches of most species are smooth and the branchlets are usually long,

slender and pliant. Most species have numerous long roots which penetrate into the moist soil and by a network of fibers supply protection against the water of streams wearing away the banks. The slender and pliant branchlets of some species have been utilized from the earliest time for basket work and in the early history of Europe were twisted into ropes. This class of willows is known as osier and includes the two kinds generally called velvet osier and purple osier. The leaves of some species are used for fodder, some furnish excellent timber and valuable wood for gunpowder charcoal, and others yield bark which is rich in tannin.

Fully 160 different species of willows have been catalogued, of which 35 are native to North America. Most of the American species yield a wood which is too soft for construction purposes, but it possesses value for charcoal and fuel. It is employed in making furniture, baskets, and various household utensils. The white willow

is especially valuable for making charcoal for gunpowder. It is planted in many places for its wood and for protection of other trees against winds, its rapid growth making it of particular value for that purpose. The weeping willow is a fine ornamental tree native to Asia and has been in-



WILLOW BASKET.

troduced in many parks and cemeteries of America. The branchlets of this species are remarkable for their drooping habit, thus making a large tree very attractive. It has long been considered as symbolical of mourning. The salix regalis is greatly admired for its white, silvery leaves.

WILMINGTON (wil'ming-tun), a city of Delaware, county seat of Newcastle County, 28 miles southwest of Philadelphia, Pa. It is situated on the Delaware River and on the Baltimore and Ohio, the Philadelphia, Baltimore and Washington, and the Wilmington and Northern railroads. The harbor is sufficiently deep for the landing of large steamers and lines are maintained with many commercial centers, both for the conveyance of freight and passengers. Intercommunication is by electric railways, which extend to many inland points. The site is on elevated ground, overlooking the Delaware, which is about three miles wide at this point, and within the city is the junction of Christiana and Brandywine creeks. The streets are platted regularly, crossing each other at right angles. They are improved and beautified by parkings, pavements, and gas and electric light-

Among the chief buildings are the county courthouse, the post office, the public library, the customhouse, the auditorium, and the Equity Guarantee and Trust Company's building. The Holy Trinity Church, built by the Swedes in 1698, is one of the oldest ecclesiastical structures in the United States. The public schools are well organized. It has many fine hospitals and charitable institutions, such as the State Hospital for the Insane and the Home for Friendless and Destitute Children. It is the seat of the Wesleyan Female College, the Delaware Institution, the Rugby Academy for Boys, the Delaware Industrial School for Girls, and the State Normal University.

Wilmington is important as a commercial and manufacturing center. Much water power for industrial enterprises is obtained from the Falls of the Brandywine. It has large interests in shipbuilding, the construction of railway cars and machinery, the manufacture of paper, and the production of morocco leather. About four miles from the city is a large powder factory. The general manufactures include clothing, machinery, leather, saddlery, hardware, and pottery. It is the center of a large trade in merchandise, fruits, and general manufactures.

The site of Wilmington was first settled by the Swedes under Peter Minuet in 1838 and the locality was named Fort Christina. Later the village became known as Christinaham. The Dutch under Peter Stuyvesant bought the region from the Indians in 1655 and Fort Christina was taken by them the same year. Nine years later the place was captured by the English, after which it was added to the proprietary possessions of William Penn. Thomas Willing platted a town in 1737, which became known as Willingstown, but eight years later the name was changed to Wilmington. Chad's Ford, about twelve miles distant, was the scene of the Battle of Brandywine. Population, 1910, 87,411.

WILMINGTON, the largest city in North

Carolina, county seat of New Hanover County, on the Cape Fear River, eighteen miles from the sea. It is on the Atlantic Coast Line, the Seaboard Air Line, and other railroads. harbor is well improved and has steamboat connections with the principal ports on the Atlantic. Among the noteworthy buildings are the county courthouse, the United States government building and marine hospital, the city hall, the public library, the Cape Fear Academy, the Masonic Temple, the Y. M. C. A. building, and the county and city hospitals. The manufactures include carpets, turpentine, creosote, cotton and woolen goods, cotton-seed oil, hardware, lumber products, and machinery. The exports consist chiefly of turpentine, cotton, rosin, and lumber. Gas and electric lighting, waterworks, storm drainage, and electric street railways are among the general facilities. Formerly the site was occupied by Newton, a town founded in 1730, but the name was changed to Wilmington in 1739. The place was incorporated as a city in 1866. was the chief port of entry for the Confederates in the Civil War. Population, 1910, 25,748.

WILMOT (wil'mot), David, jurist and statesman, born in Bethany, Pa., Jan. 20, 1814; died March 16, 1868. After studying in his native city and at Aurora, N. Y., he pursued a course in law and in 1834 was admitted to the Pennsylvania bar. He was elected to Congress as a Democrat in 1844, serving until 1851, and was a member of the United States Senate from 1861 to 1863. In the latter year he was appointed judge of the United States court of claims. Wilmot is best known as the author of

the Wilmot Proviso, a measure introduced by him in 1846, which provided that neither slavery nor involuntary servitude shall ever exist in any part of the territory purchased from Texas, except for crime. It was in the form of an amendment to a bill appropriating \$2,000,000 for the purchase of a part of the territory secured by the annexation of Texas, and, though passing the House in amended form, it failed in the Senate. The Wilmot Proviso was brought up and debated for a number of years whenever new territories were to be organized, as in the case of California, Oregon, Utah, and New Mexico. The doctrine embodied in it was finally established by Congress in 1861, when an act was passed prohibiting slavery "in any territory of the United States now existing, or which may be hereafter formed or acquired." Wilmot was judge of the United States court of claims from 1863 until his death.

WILMOT PROVISO. See Wilmot, David. WILSON, Alexander, American naturalist, born in Paisley, Scotland, July 6, 1766; died in Philadelphia, Pa., Aug. 23, 1813. His father was a weaver. He worked at the weaving trade for some years, but afterwards became a peddler. In the meantime he wrote a number of poems and published a small volume of collected poems. He came to the United States in 1794 and peddled a number of years in Delaware and New Jersey. While thus engaged he studied bird life, made a collection of American birds, and in 1804 visited Niagara Falls and western New York. Later he made a tour of the Southern States and was accompanied in some of his journeys by George Ord. His chief writing is "American Ornithology," a valuable work in seven volumes. It was not wholly completed at the time of his death, but an addition to it was made by George Ord, and it was further enlarged by Lucien Bonaparte.

WILSON, Henry, statesman, born in Farmington, N. H., Feb. 16, 1812; died in Washington, D. C., Nov. 22, 1875. He was the son of a day laborer and at the age of ten years became employed on a farm. Greatly interested in reading and study, he spent his leisure time in that way. It is said that he read about a thousand volumes of useful books before he reached the age of 21 years. His name originally was Jeremiah J. Colbath, but in 1833 he changed it for some unstated reason to Henry Wilson. Subsequently he learned the trade of a shoemaker at Natick, Mass., and at the same time pursued a course in the Concord Academy. In 1840 he became noted as a public speaker in support of Harrison for the Presidency and served as a Whig in the State Legislature for ten years, but afterward denounced that party and joined the Free Soilers. He was the candidate of the Free Soil party for Governor in 1853, but was defeated. In 1855 he became a member of the United States Senate as a Union

candidate, and went over to the Republican party when that organization was formed. He served as chairman on the Committee of Military Affairs during the war and ranked as one of the chief opponents of slavery. In 1872 he was elected Vice President on the ticket with President Grant. He died before the expiration of his term. Wilson wrote "Military Measures in Congress," "Anti-Slavery Measures in Congress," "Rise and Fall of the Slave Power in America," "A Contribution to History," and "Obituary Addresses." The last mentioned is a collection of speeches delivered by him in Congress.

WILSON, James, agriculturist, born in Ayrshire, Scotland, Aug. 16, 1835. In 1852 he came with his parents to America and settled with



JAMES WILSON.

them in Connecticut, where he received an academic education. He removed to Tama, Iowa, in 1855, giving his attention to practical and scientific farming. In 1872 he was elected to Congress as a Republican, serving in that body for six years. He was regent of the Iowa State University from 1870 to 1874 and subsequently served for six

years as professor of agriculture and director of the agricultural experiment station at the Iowa College of Agriculture and Mechanic Arts, Ames. In 1897 he was appointed Secretary of Agriculture in the Cabinet of President McKinley, in which position he was retained by President Roosevelt and by President Taft. Wilson was not only an efficient officer, but materially aided in disseminating knowledge in agricultural arts. He contributed many able articles to magazines and other periodicals.

WILSON, James, jurist, born near Saint Andrews, Scotland, in 1742; died Aug. 28, 1798. He studied at the universities of Glasgow and Edinburgh and in 1766 emigrated to Pennsylvania. For some time he was tutor in the University of Pennsylvania and afterward practiced law at Reading, Pa., and at Annapolis, Md. In 1775 he was made a member of Continental Congress, where he advocated the American cause with much earnestness, and was a signer of the Declaration of Independence. In 1787 he was a member of the committee which drafted the Federal Constitution and later took part in the Pennsylvania convention which ratified that document. He was made one of the judges of the Supreme Court in 1889 Bird Wilson, his son, published an addition of his speeches and lectures.

WILSON, James Grant, American author, born in New York City, April 28, 1832; died Feb. 1, 1914. He studied at College Hill, Poughkeepsie, N. Y., and later joined his father in the book business at Chicago. At the beginning of the Civil War he was commissioned major, served in a number of important battles under Banks and Grant, and in 1865 was promoted brigadier general. He settled in New York City after the close of the war and devoted himself to a literary career. In 1884 he became president of the New York Genealogical and Biographical Society. He published "Sketches of Illustrious Soldiers," "Memorial History of the City of New York," "Poets and Poetry of Scotland," "World's Largest Libraries," "Bryant and His Friends," and "Life of James Bayard." He edited Appleton's Cyclopaedia of American Biography.

WILSON, James Harrison, soldier, born at Shawneetown, Ill., Sept. 2, 1837. After graduating at West Point Military Academy, in 1860, he was assigned to the corps of topographical engineers. He was aid-de-camp to General Mc-Clellan in the Maryland campaign, served as inspector general of the army of the Tennessee at Vicksburg, and was brevetted major general of volunteers in 1864, for "gallant and meritorious services" during the war. In 1865 he took part in the battles of Franklin and Nashville and the same year conducted a cavalry expedition into Alabama and Georgia, capturing Selma and Montgomery, Ala., and Columbus and Macon, Ga. He was major general of United States volunteers in the war against Spain, taking part in the occupation of Cuba and the Porto Rican campaign, and subsequently joined the China relief expedition. In conjunction with American and British troops he did much to secure control of the entrance to Peking. In 1901 he was placed on the retired list. He published "Life of General U. S. Grant," "Life of Andrew Alexander," and "Life and Services of Major General Alexander McCook." He joined Charles A. Dana in publishing "China: Travels and Investigations of the Middle Kingdom."

WILSON, John, author, best known in literature as Christopher North, born in Paisley, Scotland, May 19, 1785; died April 3, 1854. He first studied under a private tutor and afterward at Glasgow University and Oxford, graduating from the latter institution in 1807. In 1811 he married Jane Penny, a lady of Liverpool, and soon after published his first volume of poems, entitled "Isle of Palms." Later he settled on an estate near Windermere, where he formed a warm friendship with Coleridge, Wordsworth, DeQuincey, and Southey. When Blackwood's Magazine was established, in 1817, he became one of its chief contributors. In 1820 he was

3158

elected to the professorship of moral philosophy in Edinburgh University, which position he filled successfully till 1851, when he resigned on account of failing health. A penson of \$1,500 per year was conferred upon him after retiring from the professorship. Wilson ranks among the most noted Scottish authors and his works are read with as much interest as those of Scott and Burns. Most of his productions were published as magazine articles, but, besides these, he published "City of the Plague," a poem, "Trials of Margaret Lindsay," "Lights and Shadows of Scottish Life," "Recreations of Christopher North," "An Essay on the Genius and Character of Burns," and "The Foresters."

WILSON, John, missionary, born at Lauder, Scotland, Dec. 11, 1804; died June 8, 1881. He studied at the University of Edinburgh and in 1828 began missionary work at Bombay, India. In 1843 he took up the mission work of the Free Church of Scotland. His work is important in that he exercised a wide and powerful influence upon the educational and social affairs of the native Indians. For some time he was vice chancellor of the University of Bombay. His numerous writings include "The Lands of the Bible," "An Exposure of the Hindu Religion," "India Three Thousand Years Ago," "The Parsi Religion," and "The Evangelization of India."

WILSON, John Moulder, soldier and engineer, born in the District of Columbia, Oct. 8, 1837. He graduated at West Point in 1860 and the following year entered the Union service as a military engineer. In 1863 he was made captain of engineers and later was promoted to the rank of colonel for gallantry in various battles. He retired as brigadier general in 1901.

WILSON, William Bauchop, public man, born at Blantyre, Scotland, in 1862. He came to the United States in 1870, worked in the coal mines of Iowa and Pennsylvania, and served eight years as secretary of the United Mine Workers of America. In 1906 he was elected to Congress and was twice reëlected. He entered the Cabinet of President Wilson in 1913 as Secretary of Labor.

WILSON, William Lyne, statesman, born in Jefferson County, Virginia, May 3, 1843; died Oct. 16, 1900. After studying at Charlestown Academy he entered the Columbian College, D. C., and afterward graduated from the University of Virginia. He served in the Confederate army during the war, held a professorship in Columbian College, and later practiced law at I Charlestown, W. Va. Subsequently he again undertook educational work by accepting the presidency of the University of West Virginia. In 1882 he was elected to Congress as a Democrat serving in that body as an influential member six consecutive terms. He became prominent as an orator and writer, and was a pronounced advocate of civil service reform and tariff revision. In the 53d Congress he was the leader

of the Democratic majority, officiated as chairman on the Committee on Ways and Means, and as such introduced the Wilson Tariff Bill. He was defeated for reëlection in 1894, but was appointed by President Cleveland as Postmaster General to succeed William S. Bissell.

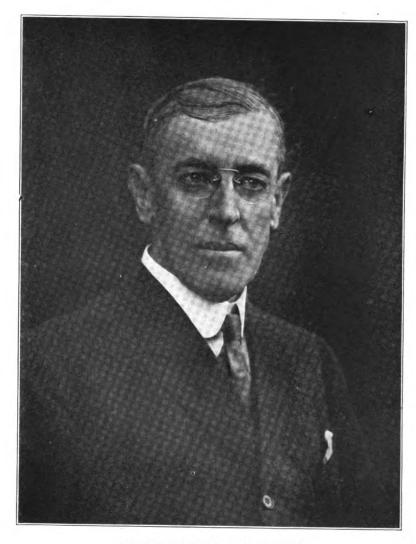
WILSON, Woodrow, educator and statesman, born at Staunton, Va., Sept. 28, 1856. He graduated at Princeton University in 1879, studied law at the University of Virginia, and later attended Johns Hopkins University. From 1885 to 1886 he was an associate professor of history at Bryn Mawr College, where he held positions until 1888, when he became professor of history at Wesleyan University. He was made professor of jurisprudence and politics at Princeton University in 1890, where he had great success as a teacher, and in 1902 was chosen president of that institution. He served efficiently until 1910, when he was elected governor of New Jersey, from which office he resigned in 1913.

In 1912 Wilson was the nominee of the Democrat party for President and was elected, carrying 42 states and receiving 454 electoral votes, the largest number ever given to any candidate for that office. He announced his intention to carry out the pledges of his party and called an extra session of Congress in April, 1913, to revise the tariff. Other events of his administration include the recognition of the Chinese Republic, the Income Tax Law, the adoption of the Amendment providing for the election of United States senators by direct vote of the people, the enactment of alien land laws, the establishment of the Federal Reserve banks, the revolution in Mexico, and the war in Europe. In 1916 he was again nominated for President by his party and was re-elected, defeating Charles E. Hughes, the Republican nominee. America became a participant in the war in Europe in 1917, after which he devoted his attention to the organization of the country for war on a large scale. He published "A History of the American People," 'The State: Elements of Historical and Practical Politics," "Congressional Government," "Division and Reunion" and "Life of George Washington."

WINCHELL (win'chel), Alexander, geologist, born in Northeast, N. Y., Dec. 31, 1824; died in Ann Arbor, Mich., Feb. 19, 1891. His many writings include "Geology of the Stars," "Sketches of Creation," "Geological Studies," "Doctrine of Evolution," "Grand Traverse Region," "Reconciliation of Science and Re-Region," "Reconciliation of Science and Religion," and "Walks and Talks in the

· Geological Field."

WINCHENDON (win'chen-dun), a town of Massachusetts, in Worcester County, 68 miles northwest of Boston. It is on the Boston and Albany and the Boston and Maine railroads and is surrounded by a fertile region. The manufactures include cotton and woolen goods, machinery, hardware, and clothing. Among the chief buildings are the high school, the public



(Opp. 3158.)

WOODROW WILSON
President of the United States

CABINET OF PRESIDENT WILSON

Secretary of State,
ROBERT LANSING of New York.,

Secretary of the Treasury,
WILLIAM G. McADOO of New York.

Attorney-General, THOMAS WATT GREGORY of Texas.

Secretary of War, NEWTON DIEHL BAKER of Ohio.

Postmaster-General,
ALBERT BURLESON of Texas.

Secretary of the Interior, FRANKLIN K. LANE of California.

Secretary of Agriculture,
DAVID A. HOUSTON of Missouri.

Secretary of the Navy,
JOSEPHUS DANIELS of North Carolina.

Secretary of Labor,
WILLIAM B. WILSON of Pennsylvania.

Secretary of Commerce,
WILLIAM C. REDFIELD of New York.



library, an orphanage, and several fine churches. The region was first settled in 1752, and the town was incorporated under its present name in 1764. Population, 1910, 5,678.

WINCHESTER (win'ches-ter), a city of Kentucky, county seat of Clark County, eighteen miles southeast of Lexington, on the Louisville and Nashville and the Chesapeake and Ohio railroads. It is situated in the famous Blue Grass region. The principal buildings include the county courthouse, the high school, and the Kentucky Wesleyan College. Among the manufactures are flour, tobacco products, carriages, and farming machinery. The streets are improved by electric lighting, grading, waterworks, and drainage. The trade in live stock, cereals, and lumber is important. It was incorporated in 1792. Population, 1910, 7,156.

WINCHESTER, a town of Massachusetts, in Middlesex County, seven miles northwest of Boston, on the Baltimore and Maine Railroad. It is popular as a residential center for Boston business men. Middlesex Falls, a large State park, is partly within the town. Other features include the public library, the State Aviary, and the home for the aged. It has manufactures of leather, felt goods, machinery, and earthenware. Originally the place was known as Waterfield, but it has been called Winchester since 1850. Population, 1905, 8,236; in 1910, 9,309.

WINCHESTER, a city of Virginia, county seat of Frederick County, 148 miles northwest of Richmond, on the Cumberland Valley and the Baltimore and Ohio railroads. It is surrounded by a fertile farming and stock-growing country and has a growing trade in fruits and merchandise. The manufactures include shoes, furniture, clothing, machinery, and ironware. It has the county courthouse, a public library, the Valley Female College, the Fairfax Hall, the Shenandoah Valley Academy, and Confederate and Federal cemeteries. Winchester was the scene of a number of important events in the Civil War. It was at Winchester that Sheridan heard of the battle at Cedar Creek and started from the vicinity on his famous ride to save the day. It was chartered as a city in 1874. Population, 1900, 5,161; in 1910, 5,864.

WINCKELMANN (vin'kel-man), Johann Joachim, noted archaeologist, born in Stendal, Germany, Dec. 9, 1717; died June 8, 1768. His father was a shoemaker and he pursued his school work under adverse circumstances. Later he studied at Berlin, Halle, and Jena, making a specialty of literature and ancient languages. Subsequently he taught several years at Seehausen, was librarian at Nöthnitz, and afterward visited Rome. Later he traveled in Southern Europe, where he gathered many valuable antiquities. Maria Theresa presented him with some rare coins while he was in Vienna, but he was afterward murdered for them by a thief at Trieste. Writers regard him the found-

er of scientific archaeology. He published "History of Ancient Skill," "Thoughts on the Imitation of Greek Works in Painting and Sculpture," and "Trial of an Allegory."

WIND, a current of air moving in the atmosphere, which is caused by variations of temperature in different latitudes, or in various portions of the same latitude. When all parts of a layer of atmosphere are equally dense, a calm extends over the region, but as soon as different parts of the layer become of an unequal temperature there is a more or less perceptible movement of air. This is caused by the sun heating the surface of the earth more easily in some parts than in others, thus causing the air above the more heated parts to expand and become lighter, which is then pressed upward by the colder air that rushes in from all sides to take the place of the ascending current. The ascending currents gradually become deflected and form upper currents from the heated surface, but later settle down near the surface to replace the air that has moved in lateral surface currents toward the heated area. A circulatory motion continues in the air as long as the heated area remains warmer than the surrounding regions.

Sea breezes are caused in the same way. The surface of the land becoming more highly heated than that of the water, owing to the fact that the sun's rays penetrate more deeply into the water, an ascending current rises over the land and a breeze sets in from the sea every afternoon. At night the land becomes cooled more rapidly than the water, hence the ascending current then rises from the water and a land breeze sets in from the land sometime after midnight. Since the strength of these winds depends upon the difference of the temperature of the land and the water, they are best defined in the tropical and intertropical regions, though they occur in many of the higher latitudes during the hotter part of the year. Currents of electricity and the condensation of aqueous vapors rising from the surfaces of rivers and seas have a more or less noticeable effect upon the air, though the chief cause of winds is the unequal distribution of heat. The anemometer is an instrument to measure the force and velocity of winds. Winds have a relatively vast difference in the force and velocity. A wind blowing at the rate of 100 miles an hour has a pressure of 50 pounds to the square foot, a force sufficient to move loose objects along the surface of the earth. On the other hand, a breeze of 20 miles has two pounds of pressure to the square foot and a light wind moving at the rate of five miles has only two ounces.

Winds are named after the direction from which they blow, as an east wind, a northeast wind, a north wind, etc. They are also designated as constant, or those whose direction remains the same throughout the year; periodical,

or those which blow alternately in opposite directions for regular periods; and variable, or those which blow in any direction. Equatorial currents blow as upper currents from the Equator toward the poles and move in a direction opposite to the surface wind, while polar currents are lateral surface currents that flow from the poles to the Equator. The earth rotating upon its axis from west to east, there is a constant tendency to deflect the direction of the winds from a straight line drawn between the Equator and the poles. Thus the polar currents, when unaffected by local disturbances, blow from the southeast in the Southern Hemisphere and from the northeast in the Northern, while at the Equator their direction is nearly due east. The equatorial currents blow from the northwest in the Southern Hemisphere and from the southwest in the Northern, but it must be observed that the lateral surface currents are felt mainly as moderate winds.

The zone of calms is a region extending from about 2° to 11° north latitude. It is caused by the ascending currents near the Equator neutralizing the inblowing polar currents, thus producing calms. From the zone of calms to about 30° on each side of the Equator the polar currents blow with such constancy that they have been named trade winds, from their value to commerce. In the Northern Hemisphere their direction is northeast and in the Southern it is southeast. Beyond the trade winds is a region of periodical calms, and still farther toward the poles is a great belt of variable winds, in which the equatorial and polar currents alternate as predominating winds. Besides these are numerous winds that bear local names, such as the typhoon, sirocco, harmattan, etesian, and simoom. The light winds of the Indian Ocean are called monsoons; the hot desert winds sweeping across Northern Africa, simooms; the storms in the Gulf of Guinea, tornadoes; and those of the Pacific, typhoons. Chinook winds are those occurring on the eastern slopes of the mountains from Colorado to the Peace River. They are warm and dry, continuing from a few hours to several days and usually coming from a westerly or northerly direction. See Whirlwind.

WINDER (win'der), William Henry, soldier, born in Somerset County, Maryland, Feb. 28, 1775; died Feb. 7, 1824. He studied at the University of Pennsylvania and took up the practice of law. In 1812 he was made colonel in the military service and in the same year commanded an expedition that invaded Canada from Black Rock, N. Y. The following year he was promoted to brigadier general and was taken prisoner at Stony Creek, but was released in 1814 He commanded at the Battle of Bladensburg, where he was defeated, and thus became unable to prevent the British occupation of Washington. At the close of the war he was

honorably discharged and took up the practice of law in Maryland, where he was elected to the State senate.

WINDERMERE (win'der-mer), a freshwater lake of England, in the northwestern part of the country. It lies in the counties of Lancashire and Westmorland. The overflow is by the Leven River into Morecambe Bay, an extension of the Irish Sea. The lake is one mile wide and fourteen miles long and containe a number of fertile islands. Rydal, the home of Wordsworth, is situated near its northern extremity.

WINDLASS (wind'las), a familiar form of the wheel and axle, used for raising weights by means of winding a chain or rope around a cylinder. The cylinder in the capstand is usually vertical, while in the windlass it is horizontal, and in the latter machine it is made to revolve either by a winch or handspike. See Wheel and Axle.

WINDMILL, a machine which is turned by the wind and designed to furnish motive power, as for pumping or for operating mills. Machines of this kind came into use in Europe about the 11th century, but the form was very different from that of the windmills which are now in general use. They consisted essentially of a rotating cap attached to the tower, with four to six canvas-covered frames to receive the wind and an eccentric attached to the shaft for driving the machinery below. Windmills of similar construction are still employed to a considerable extent for pumping in the dike regions of the Netherlands. The windmills used extensively at present for pumping water on farms consist of a tower, trestled or inclosed, within which is a shaft having at the top a rotary shaft set at right angles, bearing a steering rudder at one end and a system of adjustable slats or sails radiating from the other.

In most mills the sails are made of narrow wooden slats, forming a circular disk, but sheet iron and steel turbine sails have gone largely into use within recent years. To keep the sails facing the wind, a self-adjusting fan or flyer is attached to the projecting framework at the rear. As the mill is turned by the air it revolves a crank, which transmits motion to the machinery below. Power cannot be obtained by means of a windmill unless there is a reasonable movement of air. Considerable advantage is gained by placing the windmill on a lofty tower, but it has been found that the average time a windmill can be utilized does not exceed 10 hours out of 24, though this depends very largely upon the locality where it is situated. On many farms an automatic mechanism is placed in a watering tank, which serves to stop the mill when the tank is pumped full of water. In some localities tracts of land are irrigated by water being pumped by means of windmills.

WINDOM (win'dum), William, statesman,

born in Waterford, Ohio, June 10, 1827; died in New York City, Jan. 29, 1891. After attending the public schools and an academy, he studied law and in 1850 was admitted to the Ohio bar. Soon after he removed to Minnesota and served as a member of Congress from 1859 to 1869 and was United States Senator from 1870 to 1881. President Garfield appointed him Secretary of the Treasury in 1881, but he resigned at the death of the latter, and again served as United States Senator from 1881 to 1883. His eminent success and statesmanship caused President Harrison to select him as Secretary of the Treasury in 1889, but he died before the expiration of his term, after concluding an important speech at Delmonico's.

WINDOW, an opening in the wall or certain parts of the roof of a building, intended for the admission of light and partly as a means of ventilation. Openings of this kind were common among the people of ancient times, but they were comparatively small and few in number. The Egyptians had windows in dwellings and structures intended for military purposes, but rarely employed them in buildings intended for religious worship. The Greeks use glass to a considerable extent in covering the openings to prevent the admission of external air, but the forms were very irregular, usually of triangular Windows were common or oblong outline. among the Romans, who enlarged the openings, thus securing an increase in light and a better command of the surrounding prospect. In Western Europe the openings in the walls were little more than narrow slits until the 12th century, when glass came into general use. Stained glass has continued to be popular for churches and chapels, but has gone largely out of style for private dwellings, although some windows, where the view is obstructed, are either of stained or glazed glass.

The forms of windows used at present are almost endless in variety, but most of them may be grouped under two styles known as the Gothic and the Italian. These styles are alike serviceable in contributing to the general decoration or architectural effect of a building. At the same time they serve the purpose of admitting light and external air, as well as shutting out cold and moisture. Windows in shops and stores are generally large in size, from ten to fifteen feet square, and are made of plate glass. The glass is usually set in a frame, or sash, which is made of wood or metal.

WINDSOR (win'zer), a city of Canada, in the Province of Ontario, on the Detroit River, opposite Detroit, Mich. It is on the Wabash, the Grand Trunk, the Michigan Central, the Canadian Pacific, and other railroads. Extensive wharves and regular communication by steamboats are maintained. The noteworthy buildings include the city hall, the high school, the public library, the International Hotel, and

many churches. It has a large trade in live stock, cereals, lumber, and merchandise. The manufactures include salt, cotton and woolen textiles, ironware, shoes, lumber products and machinery. The place has sanitary sewerage, public waterworks, electric street railways, and other municipal facilities. Limestone and salt deposits are worked in the vicinity. Population, 1901, 12,153; in 1911, 17,829.

WINDSOR, a town of England, in Berks County, 22 miles west of London. It is finely situated on the Thames River and may be reached by railways and steamboats. Windsor Castle, the noted palace of the English sovereigns, is its chief attraction. This fine structure is situated on the east side of the town, where its elevated site furnishes a grand view of the Thames River and surrounding region. The history of Windsor dates from the reign of Henry III., who erected a tower on the present site of the palace, but Edward III. rebuilt it in 1344, largely to accommodate the Knights of the Garter. As at present arranged, the castle occupies the so-called Little Park, a tract of land four miles in circumference, while surrounding the latter is the Great Park, having a circuit of eighteen miles. Windsor Forest is a still larger park, which contains many oaks estimated to have grown fully a thousand years. Among the chief attractions are Saint George's Chapel, the installing place of the Knights of the Garter; the round tower or keep, formerly used for state prisoners; and the old and new state apartments In Saint George's Chapel are the vaults of many sovereigns, including Henry VI., Henry VIII., George III., George IV., William IV., and the unfortunate Charles I. It has a royal library with beautiful collections of drawings, portraits, paintings, and valuable printed volumes. The town of Windsor has few manufactures aside from tapestry, but is a point of interest to tourists. It has a number of fine schools, churches, and hotels. Population, 1918, 14,386.

WINDWARD ISLANDS (wind'werd), an island group of the Lesser Antilles, lying east of the Caribbean Sea and extending between the Leeward Islands and Trinidad. The name is applied somewhat loosely to include Martinique, an island belonging to France, but in a more restricted sense it has reference to the British colony comprising all the islands between Trinidad and Martinique, lying west of Barbadoes. This colony has an area of 524 square miles. It includes the islands of Saint Vincent, Saint Lucia, Grenada, and the Grena-Negroes constitute the chief part of the inhabitants. Among the principal productions are coffee, sugar, spices, cacao, rum, and tropical fruits. The climate is quite favorable, but hurricanes are frequent and the rainfall is excessive. Saint George's, on Grenada, is the capital and seat of government.

WINE, the fermented juice of fruits, but the name is applied more particularly to the product obtained by fermenting the juice of the grape. Many widely different varieties of wine are manufactured, the peculiar qualities depending upon the season, age, climatic conditions, and the fruits used in their production. All these more or less influence the flavor, color, and effect upon the tongue and palate. Wines are said to be dry when they contain little or no sugar and sweet, when the proportion of sugar is clearly perceptible to the taste, but between these two extremes are many marketable varieties. The essential ingredients of wine are alcohol, water, and coloring matters, but besides these wines contain glycerin, volatile oil, grape sugar, vegetable albumen, calcium tartrate, gum, and various acids, such as phosphoric, acetic, and carbonic acid. The proportion of alcohol varies from seven per cent. in certain elderberry wines to 25 per cent. in certain sherries. Wines bottled while still fermenting contain carbonic acid gas and when uncorked foam slightly and have a brisk effect upon the tongue. These are called sparkling wines, while those that do not sparkle are designated still wines.

The annual production of wine in the United States averages 55,000,000 gallons, the larger part of which is made in California. California wines are counted among the best, owing to the favorable climate and the vigorous growth of the grape on the Pacific slope. In ancient times the most celebrated wines were made by the Greeks in Lesbos and Chios and by the Romans in Cecuban. France, Germany, Spain, Italy, Portugal, Austria and Turkey are the chief wine-producing countries of Europe. Many grades of wine have a wide and favorable reputation. Bordeaux, Burgundy, and Champagne are made in France; Rhine wine and Moselle, in Germany; Tokay, in Austria-Hungary; sherry and port, in Spain and Portugal; Oporto, in Portugal; and Madeira, in the island of Madeira, off the western coast of Africa.

The manufacture of wine from grapes is an easy art in the grape-producing regions. In making the better grades of wine much care is exercised in selecting only the fully developed berries, all the faulty and unripe portions being carefully separated by hand. After removing the berries from the stems, they are placed in a wine press or large tub, where they are crushed to separate the juice from the skin and seed, which is usually done by a lever-andwedge press. In some countries the crushing is effected by men treading the grapes with their naked feet in shallow tubs. Usually the grapes are pressed several times, the expressed juice equaling about seventy per cent. of the grapes by weight. The juice has a sweet taste when first expressed from the grapes and is called must. It is placed in vats to ferment, the process of fermentation requiring a few hours or a few days, this depending upon the temperature. Small bubbles of carbonic acid gas are given off in the process of fermentation and the sugar of the juice is converted into alcohol. The fermented juice becomes clear after fermentation ceases and is drawn off into casks, in which a second or lighter fermentation takes place. As soon as fermentation ceases, the casks are closed and are ready for storage or for the market. In making Champagne wine the grapes are picked before they become entirely ripe, while port and Rhine wines require quite wellripened grapes. The color is due to the skins. In making white wines the skins are removed before expressing the juice. Other fruits used in making wines include cherries, oranges, currants, gooseberries, elderberries, raspberries, blackberries, and many others.

WINEBRENNER (win'bren-ner), John, clergyman, born in Frederick County, Maryland, March 24, 1797; died in Harrisburg, Pa., Sept. 12, 1860. He graduated from Dickinson College and, after studying theology in Philadelphia, was appointed pastor of the German Reformed Church in Harrisburg, Pa. In 1830 he left that sect and organized the Church of God, whose chief tenets are the washing of feet, baptism by immersion, and partaking of the Lord's Supper. This sect is most strongly represented in the eastern and middle states. At present it has 575 ministers, 75,000 communicants, and church property valued at \$1,115,000. The chief printing office is at Harrisburg, Pa. Winebrenner published "Brief Views of the Church of God," "History of All the Religious Denominations in the United States," "Church Hymn Book," "Pronouncing Testament and Gazetteer," and "Treatise on Regeneration." He was editor for some time of the Gospel Publisher, now the Church Advocate.

WINFIELD (win'feld), a city in Kansas, county seat of Cowley County, on the Walnut River, forty miles southeast of Wichita, on the Missouri Pacific, the Saint Louis and San Francisco, and the Atchison, Topeka and Santa Fé railroads. The surrounding country is fertile. The streets are improved by grading, waterworks, and electric lighting. Near the city is a Chautauqua ground. The noteworthy buildings include the county courthouse, the public library, the State Imbecile Asylum, the Saint John's Lutheran College, and the Southwest Kansas College. It has a growing trade in farm produce and live stock. The manufacturing establishments include flouring mills and machine shops. Limestone quarries are worked in its vicinity. The place was settled in 1870 and incorporated in 1871. Population, 1904, 7,758; in 1910, 6,700.

WINGED LION, an emblem of Saint Mark, the patron saint of Venice, Italy. It is situated on one of the columns of the Piazzetta at Venice and is constructed entirely of bronze. Na-

poleon carried it to Paris in 1797, but it was restored to Venice in 1815.

WINKELRIED (vin'kel-ret), Arnold Struth von, famous patriot of Switzerland, next to William Tell the most celebrated public man in Swiss history. The chief event with which his name has become inseparably connected is the Battle of Sempach, in 1386, when a small band of Swiss peasants opposed an army of 4,000 Austrian veterans. Leopold, the Austrian commander, had formed a solid phalanx by crowding his men with extended lances into a formidable body. Upon them rushed the Swiss patriots with remarkable bravery, but they were repulsed with great loss. At that opportune time Arnold von Winkelried, a leader of the Unterwalden forces, rushed forward and grasped a number of spears, thus making an opening through which the Swiss mountaineers rushed with heroic bravery and defeated the Austrians. Though Winkelried fell, pierced with a dozen lances, his noble deed won the independence of his country. His wife and children were carefully provided for by his comrades. A fine monument was erected to his honor in his native canton, Unterlinden, in 1865.

WINNEBAGO (win-nê-bā'gō), the largest lake of Wisconsin, in Winnebago County, forty miles west of Lake Michigan. It receives the

water from the Fox and Wolf rivers and the overflow from Lake Poygan. The length is about 30 miles, the greatest width is 10 miles, and the area is 218 square miles. It discharges through the Fox River into Green Bay. The Fox River is navigable, making the lake of value for transportation. It has fine fisheries. On its shores are the cities of Menasha, Fond du Lac, and Oshkosh.

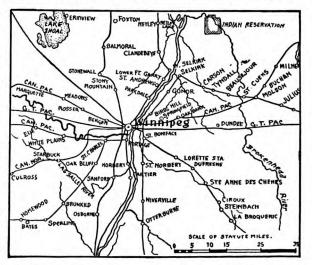
WINNEBAGOES (win-nê-bā'gōz), an Indian tribe of the Dakota family, first met with by French traders in the Green Bay region of Wisconsin. They were a powerful tribe in the 16th century and opposed the Algonquins with considerable vigor, but in the next century an alliance was formed against them and their numbers became greatly reduced. In the French and Indian War they sided

with the French, but joined the British against the colonies in the Revolution. General Wayne reduced them in 1793 and 1794. They sided against the Americans in the War of 1812. Subsequently they joined the alliance under Tecumseh. In 1829 they ceded large tracts of land and in 1866 they accepted certain lands in the vicinity of Winnebago, Neb. Several Protestant and Catholic missions and a number of schools have been conducted among them, and many have made material advancement in education

and civil arts. At present they number about 2,125.

WINNIPEG (win'ni-peg), a lake of Canada, lying in Manitoba, Keewatin, and Saskatchewan. The length is 275 miles, the width is from 40 to 62 miles, and the area is about 8,940 square miles. A basin of 395,000 square miles drains into it. The surface is 710 feet above the level of the sea. It receives the water from the Red River of the North, the Assiniboine, and the Saskatchewan rivers and its overflow passes by the Nelson into Hudson Bay. Lake Winnipeg receives the discharge from the Lake of the Woods by the Winnipeg River, a stream about 290 miles long. It has excellent fisheries, but navigation is obstructed by ice about six months of the year.

WINNIPEG, a city of Canada, capital of Manitoba, 1,124 miles west by north of Montreal and 398 miles northwest of Saint Paul, Minn. It is situated at the junction of the Assiniboine with the Red River, through which it has access to Lake Winnipeg. The transportation facilities are very extensive by the Canadian Pacific, the Canadian Northern, the Grand Trunk, the Northern Pacific, and the Great Northern railroads. Intercommunication is afforded by a system of electric railways, which operates branches to many suburban and interurban points,



and a railway line extends to the shore of Lake Winnipeg. The streets are regularly platted, crossing each other at right angles, and several fine squares and public parks are maintained in good condition. A fine residential district is located south of Portage Avenue, but handsome residences are maintained in other portions of the city, especially in Fort Rouge, the portion located south of the Assiniboine.

The city is built largely of stone and vitrified brick and many of the buildings are tall and substantial. Among the larger structures are the parliament house, the city hall, the customhouse, the Royal Alexander, the Empire, and the Queen's hotels, and numerous churches. Winnipeg is noted as an educational center, having a well-established system of public schools, a number of historical and scientific societies, and many hospitals and institutions of secondary and higher education. Among the leading educational and professional institutions are the University of Manitoba, the Saint John's College, the Manitoba Medical College, the Saint Boniface College, and the Manitoba College. Saint Boniface, a town with a large French population, is on the east bank of the Red River, connected with Winnipeg by a number of bridges.

Winnipeg is surrounded by a fertile farming country. It has a large trade in lumber, wheat, hides, live stock, and merchandise. It ranks as the greatest grain market in the British Empire. Within the last two decades it has developed extensive manufacturing interests, and its fine transportation facilities have caused the building of a vast wholesaling trade. Among the chief manufactures are flour and grist, boots and shoes, clothing and hosiery, lumber products, brick and pottery, carriages, machinery, hardware, and farming implements. It has extensive railway shops of the Canadian Pacific and is important as a banking and financial center.

The history of Winnipeg may be said to have its beginning in 1870, but before that time it was known as Fort Garry, when it was important as a trading post of the Hudson's Bay Company. A band of insurgents under Louis Riel had taken possession of Fort Garry early in 1870, and Wolseley was dispatched with a military force to dispossess them. At that time about 200 people resided in the vicinity and these served as the nucleus of the present metropolis. Soon after railway communication was established through Minnesota, and the completion of the Canadian Pacific in 1881 augmented the rapid growth. The phenomenal development of the agricultural lands in Manitoba and the country west gave the city an unusual impetus. It is now one of the best built and most progressive cities of the Dominion. Population, 1901, 42,340; in 1911, 128,157.

WINNIPEGOOSIS (wĭn-nĭ-pê-goo'sĭs), or Winnipegoos, a lake in the provinces of Manitoba and Saskatchewan, Canada, lying west of Lake Winnipeg. The length from north to south is 128 miles and the width is from 12 to 24 miles. It has an area of 1,985 square miles. The shores are indented by numerous bays. South of it is Lake Manitoba, into which it discharges by the Waterhen River. It receives the water from Swan and Red Deer riv-The overflow, after reaching Lake Manitoba, is discharged by the Douphin River and Saint Martins Lake into Lake Winnipeg, whence it passes into Hudson Bay by the Nelson River. In the vicinity are fine forests.
WINNIPISEOGEE (win-e-pe-sa'ke), or

Winnipesockee, a lake in New Hampshire, lying between Belknap and Carroll counties, 22 miles northeast of Concord. It is twenty miles long and from four to ten miles wide. The area is 176 square miles. It has an altitude of 472 feet above the sea. The shores are more or less abrupt and indented by deep bays. It has excellent fisheries and the fine scenery and numerous islands make it a favorite summer resort. The overflow is discharged by the Winnipiseogee River, which unites with the Pemigewasset River to form the Merrimac.

WINONA (wǐ-nō'nà), a city in Minnesota, county seat of Winona County, on the Mississippi River, 102 miles southeast of Saint Paul. It is on the Chicago Great Western, the Chicago and Northwestern, the Chicago, Milwaukee and Saint Paul, and other railroads. The surrounding country is highly fertile, producing cereals, grasses, and dairy products. Among the chief buildings are the county courthouse, the Federal post office, the Winona Seminary, the public library, the State normal school, the Margaret Simpson Home, and many fine school and church buildings. It has large interests in wholesaling, in grain and lumber, and in manufacturing. Among the leading manufactures are lumber products, ironware, flour, carriages, boots and shoes, bicycles, and farming implements. An extensive system of street railways furnishes transportation to all parts of the city and many adjoining places of interest. Other utilities include public waterworks and a system of sanitary sewerage. Winona was settled in 1851 and chartered as a city in 1857. Population, 1905,

20,334; in 1910, 18,583. WINSLOW (winz'lb), Edward, Governor of Plymouth Colony, born in Droitwich, England, Oct. 19, 1595; died May 8, 1665. Religious persecutions in England caused him to seek a refuge in Holland, where he became a member of Robinson's church at Levden, and in 1620 came to New England in the Mayflower. His wife died shortly after reaching Plymouth, and he afterward contracted the first wedding in the Plymouth colony by marrying Mrs. Susanna White. He won the friendship of Massasoit, the Indian chief, while treating him in a case of sickness, and afterward made several tours to England for the colony. In 1624 he became a magistrate and was chosen governor in 1633, 1636, and 1644. He represented his colony in the New England confederation. Cromwell appointed him head commissioner of an expedition against the Spanish West Indies, but he died while on the voyage. Winslow wrote several religious works and a history entitled "Good News from New England." Other writings from his pen include "Hypocrisy Unmasked" and "Glorious Progress of the Gospel Among the Indians."

WINSLOW, John Ancrum, naval officer, born in Wilmington, N. C., Nov. 19, 1811; died in Boston, Mass., Sept. 29, 1873. In 1827 he became a midshipman in the navy, was made lieutenant in 1839, and for gallant service in the Mexican War became commander of the schooner Morris. He was promoted to the rank of commander in 1855 and became captain in 1862. In 1863 he was given command of the Kearsarge. On June 19, 1864, he attacked the privateer Alabama off Cherbourg, France, and after an engagement of an hour shattered and sunk that vessel. He commanded the gulf squadron from 1866 to 1867 and in 1870 became rear admiral. In the latter year he was made commander of the Pacific squadron, but retired from active service the following year.

WINSOR (win'zer), Justin, librarian and author, born in Boston, Mass., Jan. 2, 1831; died Oct. 22, 1897. After studying at Harvard University, he pursued courses in Paris and at Heidelberg, Germany. He became superintendent of the public library of Boston in 1868, and in 1877 was made librarian of Harvard. In 1876 he was elected first president of the American Library Association. His writings are very numerous and cover a wide range of subjects. A large number of them were contributions to periodicals. His best known public works include "Christopher Columbus," "The Mississippi Basin," "Biography of Original Quartos and Folios of Shakespeare," "Life and Times of David Garrick," "From Cartier to Frontenac," and "Critical History of the United States."

WINSTED (win'sted), a city of Connecticut, one of the county seats of Litchfield County, 28 miles northwest of Hartford. It is located on the Mad and Still rivers and on the Central New England and the New York, New Haven and Hartford railroads. The chief buildings include those of the county, the townhall, the Gilbert Home for Poor Children, and the Litchfield County Hospital. Excellent water power is derived from the Mad River. It has manufactures of cutlery, leather, clocks, clothing, pins, and machinery. Electric lighting, waterworks, and sewerage are among the public utilities. The first settlement was made in 1756 and it was incorporated in 1858. Population, 1900, 6,804; in 1910, 7,754.

WINSTON (win'stun), a city of North Carolina, county seat of Forsyth County, 28 miles west of Greensboro, on the Southern and the Norfolk and Western railroads. It joins Salem, a municipality with 3,642 inhabitants, the two places being known as Winston-Salem. Among the noteworthy buildings are the county courthouse, the Federal post office, the Salem Female Academy, and the Slater Industrial Academy and Normal School. It is an important manufacturing and trade center. The manufactures include cotton and woolen goods, ironware, clothing, cigars, machinery, and farming implements. It has good municipal improvements, including electric lighting, sewerage, waterworks, and street railways. The Moravians founded Salem in 1766. Population, 1910, 17,167.

WINTER, the coldest season of the year, following autumn and preceding spring. It begins astronomically, in the Northern Hemisphere, on the shortest day, Dec. 21, and ends with the vernal equinox, March 21. In popular use the name winter is applied to the three coldest months, which are November, December, and January in Great Britain and December, January, and February in Canada and the United States. In the tropical zone the rainy season is termed winter. The winter months of the Southern Hemisphere are June, July, and August.

WINTER, William, poet and critic, born in Gloucester, Mass., July 15, 1836. He studied in Boston, took a course at the Harvard Law School, and became a contributor to the Boston Transcript. Subsequently he removed to New York, where he wrote for six years as an editor of the Saturday Press, and in 1865 became literary critic of the New York Weekly Review. He visited Europe in 1877 and on returning to America published "Trip to England." Among his best works are "Old Shrines and Ivy," "Life of Henry Irving," "Shadows of the Stage," "Stage Life of Mary Anderson," "My Witness," and "Sketches of Scotland." He died June 30, 1917.

WINTERGREEN (win'ter-gren), the name of several species of plants of the heath family, which are mostly native to the Northern Hemi-



FLOWERING WINTERGREEN.

sphere. They are perennial herbs and grow as half-shrubby plants in low woods. The checkerberry, whose aromatic leaves yield the oil of wintergreen, is a noteworthy American species. It has slender stems, which creep near the surface of the ground, and the ascending flowers are followed by red berries. It is sometimes called partridge berry, creeping wintergreen, mountain tea, and boxberry. The flowering wintergreen is another familiar species of North America, having short, erect stems and

conspicuous rose flowers. The spotted wintergreen is common in the dry woods from Georgia to New Brunswick.

WINTHROP (win'thrup), a town of Massachusetts, in Suffolk County, five miles northeast of Boston, on Massachusetts Bay and on the Boston, Revere Beech and Lynn Railroad. It is popular as a summer resort and residential center. The chief buildings include the Frost public library, the high school, and numerous summer hotels. It contains the house of Dean Winthrop, dating from 1649. The Winthrop Shore Reservation and Ingall's Park are favorite public grounds. The town has manufactures of clothing, gloves, calfskins, and machinery. It was incorporated in 1852. Population, 1905, 7,034: in 1910, 10,132.

WINTHROP, John, Governor of the Massachusetts colony, born in Groton, England, Jan. 12, 1588; died in Boston, Mass., March 26, 1649.



JOHN WINTHROP.

He graduated at Cambridge University and afterward studied law. Soon after he opposed the parliamentary policy of the Stuarts, became noted as a devout Puritan, and in 1629 was made Governor of the Massachusetts Bay Colony. He came to Salem, Mass., in 1630 with 900 colonists and continued as governor

until his death, except in the two periods from 1634 to 1637 and from 1640 to 1646. In the controversy between Governor Vane and Anne Hutchinson he supported the latter. No colonist stands higher in respect to ability and character among the early settlers of New England. He wrote a valuable journal of events in the colony, which was published under the title, "History of New England." His son, John Winthrop (1606-1676), was elected Governor of Connecticut in 1657 and held the office until his death, except one year. He obtained a charter from Charles II. in 1663 by which the colonies of New Haven and Connecticut became united.

WINTHROP, Robert Charles, public man, born in Boston, Mass., May 12, 1809; died Nov. 16, 1894. He descended from John Winthrop, the early Governor of Massachusetts. In 1828 he graduated from Harvard University, studied law with Daniel Webster, and was elected to the Legislature as a Whig. He was elected to Congress in 1840, in which he served as an influential member for ten years, and was speaker of that body for one term. In 1850 he succeeded Daniel Webster as United States Senator, but Charles Sumner defeated him when he was a candidate for reëlection. He was strenuously opposed to slavery and the Mexican

War, favored the compromise measures in 1850, and in 1856 and 1864 supported the Democrat party. Much of his time after 1854 was spent in the study of historical literature. As an orator he took high rank and delivered the eulogies upon Edward Everett and William H. Prescott.

WINTHROP, Theodore, author, born in New Haven, Conn., Sept. 22, 1828; slain June 10, 1861. He descended from John Winthrop, graduated at Yale University in 1848, and spent two years in European travel. Subsequently he engaged with the Pacific Mail Steamship Company. In 1853 he aided in surveying a canal across the Isthmus of Panama. He was admitted to the bar in 1855 and shortly after opened a law office in Saint Louis, where he gave much attention to literary work. At the beginning of the Civil War he joined a New York regiment and became military secretary to General Butler with the rank of major. He was killed by a shot while in action at Big Bethel, Virginia. His writings include "Life in the Open Air," "Love and Skates" "Cecil Dreeme" "The Canoe and the Saddle," and "Edwin Brothertoft." He contributed many articles of interest to the Atlantic Monthly.

WIRE, an even thread or slender rod of ductile metal, formerly made by hammering, but now formed by drawing through dies or holes. Though usually cylindrical, it is made in various other forms, as square, oval, and triangular. The process of making wire is called drawing and depends upon the kind of metal and the nature of the product desired. Iron and steel wires are manufactured by passing a billet of metal through the rolls in a rod mill until it is reduced to the desired size of rod. This rod is cleaned and scaled, usually by submerging in diluted sulphuric acid, and then is thrashed, a process in which the wire rod or coil is raised high in the air and thrown heavily to the ground to loosen the scale and dirt. It is then pointed on one end to enable the wire-drawer to grasp it with his tongs as it is started through the die or plate. The end is next fastened to a cast-iron reel, which is put in motion and the wire is drawn through the die with great force, thus reducing it one or more sizes in diameter. If it is desired to still further reduce the size, the wire is annealed or softened by heating, when the drawing may be repeated by pulling the wire through smaller dies.

Iron and steel dies are commonly employed in manufacturing wire, but diamond or ruby dies are required where it is necessary to have much accuracy and fineness. The larger size of wire does not exceed three-tenths of an inch. When the product is thicker than three-tenths of an inch, it is called a rod, but the only limit to its fineness is the ability of the workmen to reduce it. Gold and platinum wires used in the micrometers of telescopes are the finest, some being only TB. 500 of an inch in diameter. Wire drawing is utilized for a great variety of

purposes, and the products serve many economic uses. Among the many uses of wire are for pins and needles, fences, baling hay, handles for pails, telegraphs and telephones, strings for musical instruments, spokes in bicycles, wire netting, and book sewing. Steel wire is now in general use in the industries. Filigree work is made of gold and silver wire.

WIRELESS TELEGRAPHY. See Tele-

graph, Wireless.

WIREWORM, the name applied to the larvae of various beetles, but especially to several species of elaters. The beetles of these larvae are generally known under the names of click beetles and spring beetles. While in the larval state they feed upon the roots of living plants, to many of which they are injurious. The worms attain maturity in a period of one to five years and within this time undergo many molts. In some places the wireworms are harmful to wheat and corn. See Click Beetle.

WIRT, William, jurist and author, born in Bladensburg, Md., Nov. 8, 1772; died in Washington, D. C., Feb. 18, 1834. He attended the common schools of Maryland, studied to become a lawyer, and in 1792 began the practice of law at Culpeper Courthouse, Va. In 1808 he served as a member of the Virginia house of delegates, became district attorney in 1816, and was attorney general of the United States from 1817 to 1829. He was nominated by the Anti-Masonic party for President in 1832, receiving 33,108 popular votes and seven electoral votes, the latter being those of Vermont. Wirt delivered able arguments in prosecuting the trial of Aaron Burr and in the Dartmouth College Case. His writings include "Letters of the English Spy,"
"Life of Patrick Henry," "Address on the Triumph of Liberty in France," "Eloquence of the Pulpit," and "The Rainbow." He contributed to many representative magazines.

WISCONSIN (wis-kon'sin), a north central State of the United States, popularly called the Badger State. It is bounded on the north by Lake Superior and Upper Michigan, east by Upper Michigan and Lake Michigan, south by Illinois, and west by Iowa and Minnesota. The greater part of the western boundary is formed by the Mississippi and Saint Croix rivers. A small portion of the northwestern border is formed by the Saint Louis River, while the Menominee and the Montreal rivers separate it in part from Upper Michigan. The length from north to south is 315 miles and the greatest breadth is 294 miles. The area is 56,040 square miles, which includes 1,590 square miles water

DESCRIPTION. The surface is an undulating plain and from the southeastern corner toward the northwest is a divide between Lake Michigan and the Mississippi basin. This divide has a general altitude of about 1,000 feet and in the northern part, a short distance south of Lake Superior, it is intersected by another ridge

which extends east and west. The latter is quite hilly and includes the Gogebic Iron Range, which has elevations of from 900 to 1,780 feet above sea level. The most elevated portion is near Lake Superior, but here the surface slopes quite abruptly toward the shore, where the elevation is 600 feet. Bluffs of considerable altitude extend along the Mississippi and Green Bay. A wide valley runs across the State from the northeast toward the southwest, in which flows the Wisconsin River. Morains and lakes, resulting from glacial action, are abundant in all parts except the southwest. The glacial area covers about four-fifths of the State.

The drainage belongs to a number of systems, but may be generally classed within three drainage areas. In the northern part, north of the Gogebic Iron Range, the drainage is by small streams into Lake Superior. The eastern section is drained into Lake Michigan, while the southern and western parts belong to the Mississippi system. The rivers that drain into Lake Michigan include the Menominee, the Peshtigo, the Oconto, the Wolf, and the Fox rivers, but all of these, except the Fox, are comparatively short. About three-fourths of the surface is drained into the Mississippi, which receives the Saint Croix, the Chippewa, the Black, and the Wisconsin. Sand bluffs of considerable height characterize the course of the Wisconsin, which has beautiful scenery in the vicinity of the Dalles. The Rock and the Des Plaines rivers, though belonging to the Mississippi, cross the border into Illinois. Many of the rivers pass over escarpments, hence are valuable for the water power they furnish. Within the glacial area are about 2,000 lakes, but only a comparatively few are of considerable size. The larger lakes include Winnebago, Oshkosh, Poygan, Tomahawk, and Red Cedar.

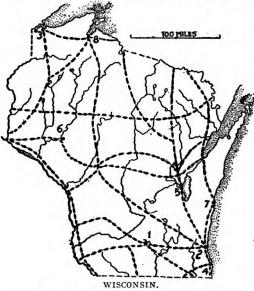
The climate is tempered somewhat by proximity to the Great Lakes, but the winters in the northern part are long and severe. Snow covers the ground from early winter until late in the spring throughout the northern half of the State. The extremes of temperature are 25° below zero in winter to 98° or even 102° above in summer. At Bayfield the mean temperature for January is 13° and at Milwaukee it is 20° while the mean temperature for July at Bayfield is 73° and at Milwaukee it is 70°. Rainfall is abundant in all parts of the State, usually about 30 inches, but it is slightly greater in the east than in the west. Precipitation is greatest between July and October. All parts of the State are healthful.

MINING. The State has extensive mineral interests, especially in the output of iron ore and mineral waters. The latter have a higher value than in any other State and show a constant gain, the annual production being about \$2,750,-000. Iron ore is obtained along the Gogebic Iron Range in the north, which extends from Michigan through the State to Minnesota, and

3168

the product is shipped largely by steamers on the Great Lakes. Warsaw, Montello, and other points are noted for their output of a superior grade of granite, which is quarried extensively for monument and building purposes. Coal is found in the southern part of the State. Sand suitable for glass as well as clays of commercial value are widely distributed. Productive zinc mines are worked in the vicinity of Plattville and a fine grade of red sandstone is obtained in Bayfield County. Other minerals include limestone, lead, graphite, and mineral paint.

AGRICULTURE. Farming is the leading occupation. Fully sixty per cent. of the area is in-



1, Madison; 2, Milwaukee; 3, Superior; 4, Racine; 5, Oshkosh; 6, Eau Claire; 7, Sheboygan; 8, Ashland. Chief railroads shown by dotted lines.

cluded in farms, which average 117 acres. Originally the region was covered largely by forests, but much of the stump land of the northern part has been cleared and is utilized in stock raising and for farming. All classes of hardy cereals are grown successfully, and the State occupies a foremost position in the production of oats, barley, rye, and buckwheat. The largest acreage is devoted to the cultivation of hay and forage plants, but it is approximated by the acreage of oats. Corn takes rank as the third crop in acreage. Other crops cultivated extensively are potatoes, peas, tobacco, beans, and sugar beets. Small fruits, such as currants, plums, and strawberries, thrive throughout the State. The southern part is noted for its production of apples, while the central section has large interests in the cultivation of cranberries.

Dairying is an important enterprise in connection with farming, and the State takes a high rank in the output of butter and cheese. The number of cattle exceeds any other class of farm animals, and nearly half of the interests are vested in dairy cows. There has been a constant increase in the number of horses and swine, and the interests in sheep raising are comparatively large. Other domestic animals include mules, goats, and poultry. The annual clip of wool is about \$1,700,000.

MANUFACTURE. Wisconsin is important as a lumber-producing State, hence has much material of use in manufacturing. The available forests are chiefly in the northern part. Among the native trees are the oak, pine, maple, hickory, cedar, birch, spruce, and hemlock. Many mills are located on the Menominee, Saint Croix, Wisconsin, Wolf, and Chippewa rivers. Lumber and lumber products have the highest value among the manufactures, but they are followed closely by butter and cheese, flour and grist, tanned and curried leather, malt and spirituous liquors, and foundry and machine-shop products. Among the general manufactures are packed meat, paper, furniture, boots and shoes, carriages and wagons, clothing, textiles, tobacco, and farming implements. Milwaukee, Superior, Racine, La Crosse, and Oshkosh are the leading manufacturing cities.

TRANSPORTATION AND COMMERCE. facilities for transportation are furnished by the Mississippi River and lakes Superior and Michigan. Railroads were not built in the State until 1850, but the lines now aggregate 7,512 miles. They include trunk lines that cross the State in many directions, furnishing direct connection with points both east and west. Among the principal railroads are the Green Bay and Western, the Chicago, Milwaukee and St. Paul, the Northern Pacific, the Chicago and Northwestern, the Chicago, Burlington and Quincy, and the Minneapolis, Saint Paul and Sault Sainte Marie. Green Bay is connected by a canal with Lake Michigan at Sturgeon Bay, and at Portage is a canal connection between the Fox and the Wisconsin rivers.

The State has large interests in commerce. It exports iron ore, lumber and timber products, malt liquors, dairy products, live stock, wool, flour and grist, potatoes, cranberries, cereals, and tobacco. The imports consist chiefly of cotton goods, machinery, and merchandise. Milwaukee is the principal port of entry.

GOVERNMENT. The present constitution was adopted in 1848, when the State was admitted. It vests the executive power in the governor, lieutenant governor, secretary of State, treasurer, and attorney-general, elected for terms of two years. The superintendent of public instruction is elected for four years at a spring election. Legislative authority is vested in the General Assembly, which consists of a senate of 33 members and a house of representatives of 100 members. The senators are elected for four and the representatives for two years. Sessions of the Legislature are held biennially, beginning on the first Monday in January. A

supreme court of five judges elected for ten years has the highest judicial authority. The power to establish circuit courts is vested in the Legislature, and the judges of these courts are elected by popular vote. Towns, municipalities, and counties have general powers in the

administration of local government.

EDUCATION. Public instruction is under the direction of a State superintendent, who is assisted by a superintendent of schools in each county. The per cent. of illiteracy is reported at 4.7, which is a slight decrease from that shown in the previous national census. A law enacted in 1907 granted special State aid for a period of three years to ungraded schools, provided certain improvements were made in heating, ventilating, and other equipments. This law has been the means of making the school facilities better and providing more efficiently for the health and comfort of the children. High schools are maintained in all the towns and cities. Many of the rural schools have been consolidated and are organized on an efficient basis under a general course of study. A large number of private and parochial schools are maintained by church and other organizations. Normal schools for the training of teachers are located at La Crosse, Milwaukee, Oshkosh, Platteville, River Falls, Stevens Point, Superior, and White Water.

The University of Wisconsin, located at Madison, is at the head of the public schools and is affiliated closely with the high schools throughout the State. Other institutions of higher learning include the Northwestern University, at Watertown; Gale College, Galesburg; Lawrence University, Appleton; Beloit College, Beloit; Ripon College, Ripon; Milton College, Milton; Marquette College, Milwaukee; Seminary of Saint Francis, Saint Francis; and Concordia College, Milwaukee. Janesville has a school for the blind, Chippewa Falls is the seat of the school for the feeble-minded, and Delavan has an institution for the deaf and dumb. Mendota and Winnebago have hospitals for the The State institution for dependent children is at Sparta. Waupun has the State prison, Green Bay has a State reformatory, and Milwaukee and Waukesha have industrial schools, the former for girls and the latter for boys. Waupaca is the seat of a State soldiers' home and Milwaukee has a national home for

soldiers.

INHABITANTS. A large proportion of the people are of foreign birth, and this element is made up largely of Germans and Scandinavians. Germans settled the southeastern part of the State as early as 1840, and this element and their descendants are more numerous than any other class. The leading religious denominations are constituted of the Lutherans, Roman Catholics, Methodists, Baptists, Congregationalists, and Presbyterians. Madison, in the southern part of the State, is the capital. Other cities include

Milwaukee, Superior, Racine, La Crosse, Oshkosh, Sheboygan, Green Bay, Eau Claire, Marinette, Fond du Lac, Appleton, Ashland, Janesville, Warsaw, Manitowoc, Kenosha, and Beloit. In 1900, the State had a population of 2,069,042. This included a total colored population of 11,131, of which number 2,542 were Negroes and 8,372 Indians. In 1905 the population was 2,228,949. Population, 1910, 2,333,860.

HISTORY. Wisconsin was formed from the Northwest Territory. Jean Nicollet, LaSalle, and French traders made the first exploration of the region and founded the first settlement at Green Bay in 1639. A Jesuit mission was located at Lapointe by Father Claude Allouez in 1665. In 1763 the region was transferred by the Treaty of Paris to the English and it became a part of the Northwest Territory in 1787. Wisconsin Territory was formed in 1836, but at that time it included Iowa, Minnesota, and part of the Dakotas. It was admitted into the Union on May 29, 1848. The Sacs and Foxes and the Winnebagoes were the chief Indian tribes and many hostilities between them and the early settlers took place at different times, but the Black Hawk War of 1832 finally subdued the Indians.

The State had a large element that favored the emancipation of the slaves in the Union. A convention of antislavery men, held at Ripon in 1854, stimulated the organization of the Free Soil and later the Republican parties. Subsequently the supreme court decided the Fugitive Slave Law to be unconstitutional within the State. A total of 91,379 men aided the Union in the Civil War. Destructive forest fires did much damage at different times, one of the most destructive occurring in 1908.

WISCONSIN, the largest river in Wisconsin, which rises in the northern part of the State, and, after a course of 600 miles toward the southwest, flows into the Mississippi four miles below Prairie du Chien. It is navigable to Portage, 200 miles from its mouth, and is there connected by a canal with the Fox River, thus supplying continuous waterway across the State from Lake Michigan to the Mississippi. The valley is highly fertile and in its upper course contains fine forests. Among the cities on its banks are Grand Rapids, Portage, Merrill, Wausau, Stevens Point, and Rhinelander.

WISCONSIN, University of, an institution of higher learning at Madison, Wis., established in 1838. It is coeducational and receives support from the State and the Federal government. Citizens of the State are admitted free in all departments, except the college of law, while others are charged a nominal tuition. The colleges include those of agriculture, law, letters and science, and engineering, and the courses compare favorably with the leading institutions of America. The grounds of the university border on Lake Mendota, a beautiful sheet of water. It has a library of 85,000 volumes and in

WISE

3170

addition contains the library of the State Historical Society, which has 250,000 volumes. The value of the building and grounds is placed at \$3,150,000. The faculty includes 300 professors and instructors and the attendance is 6,500 students.

WISE, Henry Alexander, jurist and statesman, born in Drummondtown, Va., Dec. 3, 1806; died in Richmond, Va., Sept. 12, 1876. In 1825 he graduated from Washington College, Pennsylvania, and afterward studied law at Win-He was elected to Congress as a chester. Democrat in 1832, serving in that body until 1843. He sided with the Whigs in opposition to the bank policy of Andrew Jackson. In 1840 he supported General Harrison for President, and throughout the administration of John Tyler exercised a powerful political influence. The Senate confirmed his appointment as minister to Brazil in 1844, where he resided until 1847. In 1854 he was elected Governor of Virginia and signed the death warrant of John Brown in 1859. He entered the Confederate service as a brigadier general in 1861, but was generally unsuccessful in a number of engagements. His forces were finally captured on Roanoke Island, Sept. 7, 1862, where his son, Obadiah J. Wise, was slain. He practiced law at Richmond, after the close of the war, and published "Memoir of John Tyler" and "Seven Decades of the Union.

WISEMAN (wīz'man), Nicholas Patrick Stephen, churchman and writer, born of Irish parents in Seville, Spain, Aug. 3, 1802; died in London, Feb. 15, 1865. After studying academic branches and law in Ireland, he took a course in theology at Rome, where he graduated in 1824. In 1825 he was ordained a Roman Catholic priest, became professor of Oviental languages in the Roman University, and returned to England in 1829. He officiated as a preacher and lecturer and published a number of valuable works, including lectures on the doctrines and practices of the Catholic Church and a treatise on the holy eucharist. Gregory XVI. increased the number of vicars apostolic in England in 1837 and made him coadjutor bishop. Later he became president of Saint Mary's College, and in 1849 was made vicar apostolic of the London district. The Pope summoned him to Rome in 1850 and made him archbishop and afterward a cardinal. Wiseman was a proficient student of Bible history and sciences, excelled in Hebrew and Oriental languages, and was acquainted with many European tongues. His religious works include "Points of Contact Between Science and Art," "Connection of Science and Revealed Religion," "Real Presence of the Body and Blood of Our Lord Jesus Christ in the Eucharist," "Recollections of the Last Four Popes," and "Influence of Words and Thought on Civilization."

WISSMAN (vis'män), Hermann von, African explorer, born at Frankfort-on-the-Oder,

Germany, in 1853; died June 16, 1905. He was trained for a military career and in 1874 became a lieutenant. In 1880 he was made an attaché of the German-African society and accompanied Dr. Pogge on an expedition of discovery. The party left Saint Paul de Loanda, a station on the West African coast, and in April, 1902, reached Nyangwe. From that point Wissman traveled eastward and safely reached Zanzibar. He explored the Kassai River in 1883 and subsequently visited many points of interest in the Congo basin and regions farther north, including lakes Nyassa and Tanganyika. The government of Germany made him a commissioner in 1889 to suppress an Arab uprising in East Africa, and he was governor of that region from 1895 to 1896. He published "Interior Africa," "My Second Tour of Equatorial Africa from the Congo to the Zambesi," and "Under the German Flag Through Africa."

WISTARIA (wis-tā'rī-a'), a genus of climbing shrubs of the bean family, so named after Caspar Wistar (1761-1818), professor in the University of Pennsylvania. The leaves are



pinnate and the flowers grow in clusters, generally having a lilac color. The seeds are bean-like, usually numbering five to eight, and grow in a slender pod. Several widely different species are cultivated, the best known being the common wistaria and the Chinese wistaria. They are favorite plants to cover verandas and walls. Under careful cultivation they grow 18 to 25 feet in a season and produce flowers in profusion. Some have a delicate lilac-purple bloom and in some species the flowers are pure white.

WISTER, Owen, author, born in Philadelphia, Pa., July 14, 1860. He studied at Harvard

University and took up the practice of law, but soon gave his attention to literature. His writings consist chiefly of novels and short stories and many have for their theme the life and character of western subjects. Among his books are "Red Men and White," "The Jimmy John Boss," "The Virginian," "Journey in Search of Christmas," "Ulysses S. Grant, a Biograply," "Lin McLean," and "Lady Baltimore."

WITCHCRAFT (wich'kraft), an alleged art which is supposed to be understood by witches and wizards. Evidences are abundant that good people in past ages were led to believe that certain individuals possessed supernatural power or influence by reason of being connected with some inspiration of darkness. It was supposed that these persons had made an oral or written compact with the devil, who came to their assistance in practicing infernal arts as a consideration for having abjured God. The compact was either for a certain number of years or of indefinite duration and not only implied obedience to the evil one, but the latter delivered to the witch an imp or familiar spirit to do whatever was directed. We read of an ecclesiastical decree, published at Ancyra in 350 A. D., in which soothsayers, sorcerers, and magicians were classed as witches and con-demned as enemies of God. Many proofs may be cited of profound belief in witchcraft in all the civilized countries throughout the Middle Ages. Executions of supposed witches took place with official sanction in Great Britain as late as 1722. It is remarkable that a judge of the court of queens bench in England declared in the 17th century that the common law recognized witchcraft as a crime. Even Roger Bacon had a pronounced belief in the existence of witches. In literature we find mention of the popular beliefs regarding witchcraft. Goethe's "Faust" is one of the finest examples of the reflection of public opinion. Other notable instances are those of Shakespeare's "Macbeth" and Burns' "Tam O'Shanter."

A deplorable state of public practice prevailed in Europe for many centuries owing to the widespread belief in witches. Pope Innocent VIII. issued a bull in 1484 authorizing torture to secure confessions. These tortures were applied in the most hideous ways. It was believed that the evil one had marked a spot on the body of a witch which was insensible to pain, hence it became a common practice to cut into the flesh or pierce the skin with a sharp instrument in order to find whether the person tortured could be classed as guilty. In some cases persons were thrown into deep water, those floating being regarded innocent, while those sinking were thought certainly to be possessed. The number of persons suffering martyrdom in Europe within a period of four centuries is estimated by some writers at 9,000,000. In 1515 500 persons were executed for witchery in Geneva and 975 were burned at Como in 1524. The total number of deaths in Scotland, owing to charges of witchery, is placed at 4,000. Belief in witchcraft spread rapidly among the Puritans of New England, in 1648, and for more than a century there was a widespread belief in the supposed supernatural power of certain individuals.

Cotton Mather, an eminent pulpit orator, aroused the superstitious to believe in witchery at Salem, Mass., where he preached with earnestness against the art. He wrote two works, entitled "Wonders of the Invisible World" and "Memorable Providences Relating to Witchcraft and Possessions," which had an unfortunate influence among the people. Samuel Willard, a minister of Massachusetts, in 1671, proclaimed that a woman of his congregation was bewitched, but afterward she was proved insane instead of possessed. In the period between 1684 and 1693 more than 100 persons were tried and convicted of witchcraft and many of them were hanged. Nineteen executions for alleged witchcraft took place at Salem in 1692. A man named Giles Corey, aged about eighty years, was pressed to death for refusing to plead in a special court of oyer and terminer. The delusion seems the more deplorable when it is considered that in many cases the evidence of little children and unreliable witnesses was taken as conclusive. Thomas Brattle and Robert Calef of Boston took a very decisive position against the delusion, and it is due largely to their efforts that the belief rapidly passed away.

WITCH-HAZEL (hā'z'l), or Wych Hazel, a shrub native to the eastern part of the United States and Canada, growing usually to the height of six to ten feet. The trunk branches near the ground, forming several crooked subtrunks about four inches thick. These plants grow principally in damp woods and are so named from the resemblance of their leaves to the hazel. They bear yellow flowers late in autumn, when the leaves are falling, and the fruit, which is a woody, two-seeded capsule, matures the following summer. The small branches are used as divining rods by those who believe that they turn downward when held in the hand to indicate the location of water and water veins below the surface. The liquidambar is a forest tree belonging to the same class of plants and attains a height of

twenty to thirty feet.

WITENAGEMOTE (wit'e-na-ge-mot), the national council of the Anglo-Saxons and the forerunner of the English Parliament. The small heptarchy was divided into separate kingdoms and each of these had a general council of this class. It consisted of the thanes, ealdormen, and the higher ecclesiastics and was presided over by the king. This body had general legislative power, concluded treaties, had authority to depose a king, and settled the question of succession to the throne when a dispute arose. In practice a powerful king subverted the authority

of the council to a minor position, but a weak ruler was usually governed by its orders. This body was abolished by William the Conqueror, but not until after it had acknowledged his title to the throne.

WITHERSPOON (with'er-spoon), John, signer of the Declaration of Independence, born in Gifford, Scotland, Feb. 5, 1722; died near Princeton, N. J., Nov. 15, 1794. He graduated from the University of Edinburgh in 1742, became a Presbyterian pastor at Paisley, and in 1768 accepted the presidency of Princeton College, New Jersey. His administration of the college was highly successful. He introduced lectures on political science, mathematics, international law, and moral philosophy and the study of Hebrew and French. In 1776 he was sent as a representative to the Continental Congress and while in Philadelphia signed the Declaration of Independence. He remained a member of Congress until 1782. His later years were devoted to the administration of the college, in whose interest he visited Europe twice, and spent his last days on a farm near Princeton. In Fairmount Park, Philadelphia, is a fine statue to his honor.

WITNESS (wit'nes), one who appears before a court and is examined under oath or affirmation as to his knowledge of matters undergoing judicial investigation. The writ by which a witness is summoned to appear is called a subpoena. Testimony by a witness may be given in open court, when it is usually recorded by a reporter, or it may be taken before some officer in the form of a written deposition and read at the time of the trial. Any person who is of sound mind and has sufficient capacity to understand the nature of the obligation of an oath is competent to testify as a witness, but in some cases the husband and wife are not allowed to give testimony against each other. A person who signs his name to certify to the genuineness of another signature is termed a witness.

WITTE (vĭt'tĕ), Sergius, statesman, born in Tiflis, Russia, June 17, 1849. He descended from a family of Dutch immigrants to Russia.



SERGIUS WITTE.

of Odessa and soon after entered the railroad service. He was a director of the southwestern railroads during the Russo-Turkish War and in 1888 became head of the depart-

In 1870 he

graduated at

the University

ment of railway affairs. He was made minister of finance in 1892, became secretary to Nicholas

II. in 1896, and was chief peace commissioner to settle the war with Japan in 1905 by negotiating the Treaty of Portsmouth, New Hampshire. His efficient public service caused his appointment as premier of the new cabinet in the same year, but he resigned in 1906. It is due largely to his wise counsel that Russia passed safely through the revolution of 1906. He died March 13, 1915.

revolution of 1906. He died March 13, 1915. WITTENBERG (wit'ten-berg), a city of Germany, in the province of Saxony, on the Elbe River, 54 miles southwest of Berlin. It is at the junction of several railways. The surrounding country is fertile, producing fruits and cereals in abundance. Wittenberg is famous for its connection with the lives of Luther and Melanchthon, both of whom have tombs in the Schlosskirche, on the door of which Luther nailed his 95 theses. This church now has the theses in Latin upon its bronze doors and within the building are a number of fine paintings showing scenes in the life of Luther. The Stadtkirche is another excellent church. Luther and Melanchthon preached in this building and on its walls are pictures representing famous events connected with the lives of these reformers. The city contains the houses occupied by Luther and Melanchthon. The university in which Luther taught was united with Halle in 1817, but Wittenberg still has a gymnasium, several secondary schools, and the remains of the Augustine monastery. Fine monuments built to the memory of Luther and Melanchthon are in the market place. Wittenberg has beautifully paved streets, waterworks, gas and electric lighting, electric street railways, and several valuable libraries. Among the manufactures are linen and woolen goods, leather, machinery, chemicals, and clothing. It was formerly a strongly fortified place and was the seat of the dukes of Saxony until 1422. In 1806 Napoleon captured it, but it was retaken by the Prussians in 1814. Population, 1915, 20,323.

WOAD (wod), a genus of plants found in Europe, belonging to the mustard family. Several species furnish a blue dye, which is extracted from the leaves. These plants were the principal source of such dyes until indigo was introduced. The leaves do not contain the blue coloring matter ready formed, but it is produced after subjecting them to a process of fermentation. Formerly the common woad was cultivated extensively for its leaves, which were picked and dried for transportation to the factory, where the coloring matter was developed and extracted. However, indigo, being a finer and stronger blue, has replaced this coloring material. A species of wild woad is found in England, where the Picts are said to have used it in coloring their bodies.

WOBURN (woo burn), a city of Massachusetts, in Middlesex County, ten miles northwest of Boston, on the Boston and Maine Railroad. Among the features are the public library, the high school, and many fine residences of Bos-

ton business men. The manufactures include leather, glue, chemicals, electric supplies, clothing, and machinery. It has public waterworks, electric street railways, and a considerable trade. The place was first settled in 1640 and two years later was incorporated. Population, 1910, 15,308.

WODEN (wo'den), the name of an ancient deity of the Anglo-Saxons, corresponding to Odin of the Scandinavians. Wednesday, the fourth day of the week, was named from him. See Odin.

WOERMANN (ver'man), Karl, poet and historian, born in Hamburg, Germany, in 1844. He studied law at Berlin and Heidelberg and practiced his profession at Hamburg. Subsequently he traveled in Europe and America and, after returning to Germany, took a course in the study of art history at Heidelberg and Munich. In 1874 he was made professor of the history of art at Düsseldorf and in 1882 became director of the picture gallery at Dresden, serving until 1895. Among his chief works are "General History of Art," "Illustrations from Nature," "New Poems," and "Art Among Ancient Peoples."

WÖHLER (ve'ler), Frederick, noted chemist, born in Eschersheim, near Frankfort, Germany, July 31, 1800; died in Göttingen, Sept. 23, 1882. He studied at Frankfort and Marburg and afterward pursued an advanced course in medicine at Heidelberg, where he graduated as a doctor of surgery and medicine. In 1824 he joined Berzelius and others to make a tour of northern Sweden and Norway. On returning to Germany, he formed the acquaintance of Liebig, and in 1825 became a lecturer on chemistry at Berlin. Subsequently he resided at Cassel, where he aided in establishing an industrial school. In 1836 he was made professor of chemistry at the University of Göttingen. His active career as a teacher extends over a period of more than fifty years, in which time he added much of value to the fund of general knowledge. He accomplished the isolation of aluminum in 1827, the artificial production of formic acid in 1828, and the generation of urea in 1829. His publications include "Text-Book of Chemistry," Annals of Chemistry and Pharmacy," and "Dictionary of Chemistry.

WOLCOTT (wool'kut), Edward Oliver, public man, born at Long Meadow, Mass., March 26, 1848; died March 1, 1905. He served as a volunteer with an Ohio regiment during the later year of the Civil War and subsequently attended Yale University. In 1871 he graduated at Harvard Law School, became a teacher in the schools of Colorado, and subsequently practiced law at Georgetown. He was elected district attorney in Colorado in 1876 and two years later to the State senate, serving as a Republican. He was a railway attorney from 1879 to 1884 and was a member of the United States Senate from 1889 to 1901. During the campaign of 1896 he advocated bimetallism, but supported the Republican candidate for President, and was appointed a commissioner to Europe to report on international bimetallism. In 1903 he was a candidate for the United States Senate, but was defeated by his opponent, Henry M. Teller.

WOLCOTT, John, painter and satirist, known quite generally by his pseudonym, Peter Pindar, born at Dodbroke, England, May 1, 1738; died in London, Jan. 14, 1819. He studied at the Kingsbridge free schools and afterward took a course of instruction in France, where he acquired the use of the French and became versed in Greek and Latin. In 1756 he published his first writing in Martin's Magazine. His satires were widely read, especially those relating to George III., entitled "Royal Visitor to Exeter" and "Peeps at Saint James." Other writings include "An Epistle to James Boswell," "Complimentary Epistle to James Bruce," and "Lyric Odes to Academicians." His paintings include a number of fine productions and he published, in 1797, "Six Picturesque Views from Paintings by Peter Pindar."

WOLCOTT, Roger, Governor of Connecticut, born in Windsor, Conn., Jan. 4, 1679; died in East Windsor, May 17, 1767. He was apprenticed to a weave- when twelve years of age and in 1700 established an independent business. In 1709 he was made a representative and two years later accompanied an expedition into Canada. He served successively as a member of the council, was judge of the county court and of the supreme court, held the office of deputy governor, and in 1741 became major general of Connecticut forces. In 1745 he commanded : t the siege of Louisburg and was Governor of Connecticut from 1750 to 1754. He published several poetical and historical works. His son, Oliver Wolcott (1726-1797), commanded a brigade under general Gates at Saratoga, was a member of Congress from 1784 to 1785, and became Governor of Connecticut in 1796. His grandson, Oliver Wolcott (1760-1833), was eminent as a public man. He was comptroller of the currency from 1788 to 1789, auditor of the United States treasury from 1789 until 1791, and in 1795 succeeded Alexander Hamilton as Secretary of the Treasury. From 1801 to 1802 he was a United States circuit judge and from 1817 to 1827 served as Governor of Connecticut.

WOLF, a quadruped of the genus Canis. It is closely allied to the dog, of which it is thought to be the progenitor. A number of species have been enumerated, but the mammals generally classed as wolves are all native to the Northern Hemisphere. The possible exceptions are the Aguana wolves of South America, which are allied to the prairie wolves, and the Tasmanian wolf, a marsupial. The gray wolf, which is gray above and yellowish-gray below, is the most familiar species of North America. It is three to four feet long, has a somewhat bushy tail and pointed ears, and formerly roamed in packs in New England and westward. Other American species include the

3174

dusky wolf of the Northwestern States, the rufous wolf and the black wolf of the Southern States, and the prairie wolf, or coyote, of the plains of Canada and the United States. The



COMMON WOLF.

last named is a burrowing animal and more nearly resembles the jackal than the wolf.

All the species of wolves are carniverous, pursuing their prey with much swiftness and rapacity. They are the particular dread of shepherds, whose flocks they attack. They prey upon calves, deer, and elks and some species even attack man when they are hungry. Large numbers of wolves are found in many parts of Europe, especially in the more isolated sections of Russia, Spain, Turkey, France, Germany, and Italy. The common wolf of Europe gathers in packs on the northern plains of Russia, where it is dreaded as an enemy to man and domestic animals, often pursuing travelers and visiting barnyards. In Southern Europe they find a refuge in the forests and snowy slopes of the Alps, Pyrenees, and other mountains. The true wolf has a dismal howl, which it issues when in packs, but some species have a snapping bark. All the species are crafty and cunning in searching for food and protecting their young.

WOLF, Christian von, philosopher, born in Breslau, Germany, Jan. 24, 1679; died April 9, 1754. In 1703 he graduated from the University of Leipsic, where he became a lecturer, but subsequently was made professor of sciences at Halle. He was temporarily suspended on a charge of heterodoxy, but was reinstated in 1740 at the instance of Frederick the Great. In 1743 he became chancellor of the university and two years later was created a baron for efficient services in educational work. His philosophy was generally accepted until the time of Kant. His writings were published in Latin and German. They include "Empirical Psychology," "General Cosmology," "Practical Universal Philosophy," and "Moral Philosophy."

WOLFE (woolf), Charles, poet and clergy man, born in Dublin, Ireland, Dec. 14, 1791; died in Cork, Feb. 21, 1823. He graduated from the University of Dublin, where he was a tutor

for some time, but afterward became a clergyman in Tyrone County. After becoming afflicted with consumption, he went to Southern France in search of health, but soon returned to Ireland. His best known poem is "The Burial of Sir John Moore," which was written while he was still a student. A volume of his sermons and poems was published after his death under the title "Remains and Memoir."

WOLFE, James, military leader, born in Westerham, England, Jan. 2, 1727; died Sept. 13, 1759. He was commissioned as ensign in 1741 and embarked for Flanders, where he took part in several campaigns and was present at the Battle of Dettingen. In 1745 he took part in the suppression of a rebellion in Scotland, where he became distinguished in the battles of Falkirk

and Culloden. Subsequently he served against the French at the Battle of Lawfeldt, was made major in 1749, and the following year

became lieutenant colonel. He attracted the attention of Pitt in the expedition against Rocheford, in 1757, and in the following year was appointed to command a brigade in America. Cape Breton was the objective point of his military exploit. Afterward Wolfe urged an attack on Quebec, then strongly fortified and garrison-



JAMES WOLFE.

ed, and he was made major general with orders to proceed in the plan of capturing it. In June, 1759, he appeared near the city with 8,000 men, where he was opposed by a powerful French army under Montcalm. All attempts to capture the city were resisted successfully by the French and the English began to grow discouraged, but in September Wolfe ascended to the Plains of Abraham, where he completely defeated the French and captured the city. Both Wolfe and Montcalm were slain in the battle. Monuments to commemorate these commanders were erected in Quebec. A monument also commemorates General Wolfe in Westminster Abbey.

WOLF FISH, a fish found in the North Atlantic, so called from its voracious and carnivorous habits. It has a large mouth and strong teeth and bites savagely when caught

by fishermen. In some localities it injures the nets set for other fishes. The Icelanders catch it for food, using it both fresh and salted, and a kind of shagreen is made of the skin. The common wolf fish is from five to seven feet long, but reaches its largest form in the colder waters. Several species are caught off the shores of Norway and Great Britain.

WOLSELEY (woolz'li), Sir Garnet Joseph, military leader, born near Dublin, Ireland, June 4. 1833. He entered the British army in 1852 for service in the Burmese War, in which he was dangerously wounded. The following year he took part in the Crimean War, receiving severe wounds at Sebastopol, and from 1857 to 1858 commanded as major at Lucknow during the mutiny in India. He served as lieutenant colonel in the Chinese War of 1860 and as a colonel in the army of Canada from 1862 to 1870. From 1873 to 1874 he commanded as major general in the Ashantee War, and served in South Africa in 1879 and in the Egyptian campaigns of 1882. His army captured Arabi Pasha at Tel-el-Kebir, for which he received the thanks of Parliament and was made a general and baron. In 1890 he became commander in chief of the army in Ireland, and in 1895 attained to the chief command of the British army. He published "Life of John Churchill, Duke of Marlborough," "The Decline and Fall of Napoleon," "Field Book for Auxiliary Forces," and "Narrative of the War with China." He died Mar. 25, 1913.

WOLSEY (wool'zi), Thomas, bishop and cardinal, born in Ipswich, England, in 1471; died in London, Nov. 29, 1530. He was the son of a butcher, studied in his native town, and afterward took a course of instruction at Oxford University, where he received the degree of master of arts. Soon after he was appointed a teacher of the grammar school connected with the Magdalen College, Oxford, and later became rector at Lymington. He was appointed chaplain to Henry VII. through the recommendation of several friends, and on the accession of Henry VIII. became lord chancellor to that sovereign. He was made cardinal in 1515 and pope's legate in 1518. A great lover of display, he occupied the palace of Yorkplace, now Whitehall, freely expended his revenues, and was twice an unsuccessful candidate for the Papacy. Besides founding a college at Ipswich, he projected the College of Christ Church at Oxford and built the palace at Hampden Court.

The success of Wolsey was due largely to his learning, shrewdness, and pleasing manners. He gained much influence by the fact that he obtained several diplomatic victories which enabled Henry to maintain a balance of power between Charles V. and Francis I. However, he lost royal favor when he failed to secure the Pope's permission to a divorce of Henry from Queen Catharine. The failure

was due to the opposition of Charles V., Emperor of Germany, who was the nephew of the queen. Wolsey was finally driven from court and his estates were confiscated. Soon after he retired to his diocese in York. His ability and affable manner won friends among the people and the king subsequently relented and restored him to some of his offices, but his enemies began to fear that he would again succeed to almost supreme power and had him arrested on a charge of high treason. Many years of toil and anxiety had shattered his health and the long trip in coaches to Leicester Abbey was too much for his constitution. He died the next morning after reaching his destination.

WOLVERHAMPTON (wool-ver-hamp'tun), a city of England, in Staffordshire, twelve miles northwest of Birmingham. The surrounding region contains rich coal and iron mines. The city is the seat of important steel and iron works. It has railroad connections with many trade centers, pavements, gas and electric lighting, electric street railways, public baths, and several fine parks. The chief building of interest is the noted church of Saint Peter, which was built in 996. Other edifices include a number of schools, several public halls, a free library, and numerous churches. Among the manufactures are hardware, nails, locks, furniture, edged tools, tinware, japanned ware, and machinery. It has a large trade in cereals, merchandise, vegetables, and fruits. The city dates from the time of Ethelred II. and his sister, Wulfrune, founded a college and church here in 996. It was first called Wulfrune's Hampton, from which its present name was derived. Population, 1911, 95,333,

WOMAN'S CHRISTIAN TEMPERANCE UNION, a national organization of women in the United States, organized at Cleveland, Ohio, in 1874. It is the outgrowth of a crusade conducted by women to suppress the liquor The principal objects are to secure traffic. social reform and induce habits of temperance. It has 10,000 local unions, including a branch for children, and the total membership is given at over 600,000. It maintains departments under local, county, district, state, and national superintendents, and receives and disburses annually about \$72,500 in its efforts to further progression and educational work. This society has been instrumental in securing laws which require teaching the effects of stimu-lants and narcotics on the human system in nearly all of the states. It has exercised a wide influence in obtaining better protection of girls and women, in the appointment of police matrons, and in establishing houses of refuge for erring women. Conventions are held annually by the national organization. Evanston, Ill., is the headquarters of the society and the Union Signal, published at Chicago, is the official organ.

PE

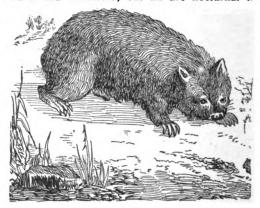
Frances E. Willard, an influential member of this society, promoted the organization of the World's Christian Temperance Union, which was established in 1883. In this work she was ably assisted by Mary H. Hunt of Boston, Mass. Branch organizations are now maintained in most countries of the world. The international headquarters are at Rest Cottage, formerly the home of Miss Willard, at Evanston, Ill. The white ribbon is worn as the badge of these societies and the policy is declared to be "Do everything."

WOMAN'S RELIEF CORPS, a patriotic society of women, organized as an auxiliary to the Grand Army of the Republic in July, 1883. All loyal women are eligible to membership, but the organization is composed chiefly of mothers, wives, daughters, and sisters of soldiers who fought in the Federal army during the Civil War. The membership is about 151,500 and the society is divided into 35 departments and 3,150 corps. Meetings are held by loyal organizations in connection with the Grand Army. The purpose is to teach patriotism to the rising generation, to perpetuate the memory of Union soldiers, and to extend charties among the widows and orphans of veterans.

WOMAN'S RIGHTS, the term commonly applied to the claim that women should be placed as nearly as possible on an equality with men, legally, socially, and politically. An organized movement for general equality between the sexes began in the United States in 1848. The National Woman's Suffrage Association was organized in 1868. Susan B. Anthony was for many years an efficient promoter of this association and many eminent women have given it much time and attention. The object is to develop public sentiment in favor of woman suffrage in all the states of the Union. Other allied associations are widely organized and have the same or similar objects in view. Collectively they have exercised considerable influence in promoting the right of women to vote at special and general elections.

The questions involved in the movement to obtain greater rights for women in politics received early attention in New Zealand, Tasmania, and the several states of the Commonwealth of Australia, in which the right of suffrage is either wholly unrestricted by sex or is nearly equally extensive to males and females. Norway is one of the first countries of Europe to grant the free use of the ballot to both sexes. A campaign for the admission of women to the elections and to public offices was commenced in England in 1906. It reached a large place in the public mind as early as 1907, when many women were arrested for insisting upon being heard by the Parliament. The general tendency in Europe and America is to extend the rights of women, but in most cases either an educational or a property standard is required. See Suffrage.

WOMBAT (wom'bat), an Australian marsupial, which somewhat resembles a small bear in appearance. The legs are short and strong, the head is large and flat, the body is broad and depressed, and the tail is rudimentary. Several species are native to Southern Australia and Tasmania, but all are nocturnal in



WOMBAT.

their habits. The body is two to three feet long. They range in color from gray to brownish-black. The day is spent largely in sleep, but at night they come forth in search of food, which consists mostly of roots and other forms of vegetation. Three or four young are brought forth at a birth and are carried for some time in the marsupium or pouch. They are animals of little intelligence and are not harmful unless they are provoked. The flesh is highly esteemed for food, its flavor resembling that of pork.

WOMEN'S CLUBS, the general name applied to organizations promoted and maintained by women. The first clubs were formed with the view of promoting religious and charitable work among women, but an extension of facilities to educate women and train them for responsible duties in public life brought about a widespread desire to cooperate more closely along general lines. Organizations of this kind are now very general in Europe and America. They are either social or educational in character, and in some countries they have assumed a form of association to promote the extension of political influence. All the larger towns and cities of Great Britain, Germany, France, Canada, and the United States have numerous clubs to promote research in literature, arts, and social development. The General Federation of Women's Clubs was formed in 1892. In 1908 it had a membership of about 175,000 in the United States and other coun-This organization places a bar upon sectarian or political tests and confines its work to social, artistic, literary, and scientific culture. Women's clubs to further political measures are numerous in New Zealand, Australia, and some states of the United States where woman's suffrage has been adopted. Similar organizations were organized very generally in Great Britain in 1908, at the time when a great crusade was organized to promote the movement for extending the right to vote and hold office to women.

WOOD, Horatio Curtis, physician and author, born in Philadelphia, Pa., Jan. 13, 1841. He graduated from the University of Pennsylvania in 1862 and began the practice of medicine in Philadelphia. In 1866 he was chosen professor of botany in the University of Pennsylvania and ten years later was transferred to the chair of therapeutics. He edited at different times the New Remedies, Medical Times, and Therapeutic Gazette. His published works include "Materia Medica and Therapeutics," "Study in Morbid and Normal Physiology," and "Nervous Diseases and their Diagnosis." His uncle, George Bacon Wood (1797-1879), was a lecturer and writer of importance. He published "History of the University of Pennsylvania," "A Treatise on the Practice of Medicine," and "A Treatise on Therapeutics and Pharmacology."

WOOD, Leonard, soldier, born in Winchester, Vt., Oct. 9, 1860. He attended Pierce Academy at Middleboro, Mass., and graduated at Harvard Medical School in 1884. The following year he was attached to the regular army as surgeon. At the outbreak of the Spanish-American War he joined Theodore Roosevelt in organizing the Rough Riders, a regiment which did effective work at Las Guasimas, being under the command of Wood as colonel and Roosevelt as lieutenant colonel. He commanded a brigade in the Battle of San Juan Hill, became a brigadier general of volunteers in 1898, and was commissioned brigadier general in the regular army in 1901. In 1899 he was made military governor of Cuba, serving until 1902, when the United States turned the government over to the new republic. In 1906 he was made commander in the Philippines, and in 1917 he became commander in the South, with headquarters at Charleston, S. C.

WOOD ALCOHOL, or Methyl Alcohol, a liquid obtained by heating wood in closed retorts, under conditions that exclude the air. The product resulting from the process involved is a mixture of wood alcohol, ammonia, acetone, and other substances and acids. This mixture is neutralized with slaked lime to separate the acids, after which the wood alcohol is isolated by distillation. When in a pure state, wood alcohol is a colorless liquid, has a peculiar aromatic odor, and mixes readily with water in any proportion. It is used extensively in the manufacture of varnishes and to prepare methylated spirit. The latter is a mixture of ten parts of wood alcohol to

ninety parts of ordinary alcohol. While it is cheaper than ordinary alcohol, it contains most of its properties and is used as a substitute for it.

WOODBERRY (wood'ber-ri), George Edward, poet and educator, born in Beverly, Mass., May 12, 1855. He studied at Harvard, where he graduated in 1877, and the same year became professor of English in the University of Nebraska. In 1878 he joined the editorial staff of the New York Nation, but returned to the University of Nebraska after two years. In the meantime he contributed to many magazines and periodicals and in 1891 was made professor of comparative literature in Columbia University, which position he resigned in 1904. His books include "Life of Edgar Allen Poe," "History of Wood Engraving," "Studies in Letters and Life," "Makers of Literature," "Collected Poems," and "America in Literature."

WOODBINE (wood'bin), the name given in Europe to the honeysuckle, so called from its habit of clinging to and winding around trees. It is a woody climber with deciduous leaves. The fragrant yellow and red flowers are in terminal heads and are succeeded by red berries. This plant has been naturalized in Canada and the United States. The name woodbine is applied locally to several species of honeysuckles, especially to the Virginia creeper, which see.

WOODBURY (wood'ber-i), Levi, jurist, born at Francestown, N. H., Dec. 22, 1789; died Sept. 4, 1851. He graduated at Dartmouth College in 1809, was admitted to the bar, and established a successful practice in his native town. In 1823 he was elected Governor of his State as a Democrat and the following year became a member of the State Legislature. Soon after he was chosen a member of the United States Senate, where he supported the policies of Andrew Jackson. The latter appointed him Secretary of the Navy in 1831 and three years later made him Secretary of the Treasury. He remained in the treasury until the close of Van Buren's administration, in 1841, when he was again elected to the Senate of the United States. In 1845 he succeeded Joseph Story as a judge of the United States Supreme Court.

WOOD CARVING, the art of carving wood into ornamental figures, or decorating it by carvings. The art is one of the oldest and long held an important position among the plastic arts. Specimens of wood carving dating from the early period of the Egyptians and Greeks have been preserved in many parts of Europe, Asia, and North Africa. The most noted is a life-size statue dating from about 4000 B. c., which was secured from the ruins of Egypt and is now in the Boulak Museum. It is carved from sycamore wood, all parts being in the solid except the right arm, which

is attached by a mortise and tenon. Other specimens of carving, such as furniture, toilet articles, surface reliefs of plants and animals, and coffin ornamentations, have been obtained from the Egyptian tombs. Though the Greeks and Romans excelled in wood carving, only a few specimens have come down in a preserved state.

In the Middle Ages, fine wood carvings were made to decorate the doorways and altars of churches and many church ornamentations, such as crucifixes. Some of the finest specimens of doorway decorations are to be found in the Scandinavian countries, while exquisite altar decorations in carvings of wood exist in Germany and Spain. The carvings made in England in the Middle Ages were destroyed largely during the Reformation, but there are newer specimens at Westminster Hall, Saint Paul's Cathedral, and Cambridge. Wood carving as an art was not confined to Europe in modern times, but there are many fine specimens made by the Mohammedans in Damascus, Constantinople, and Cairo. Other fine products of this kind were made by the Hindus, many of which are seen in the temples of India, and by the Chinese and Japanese. The modern wood carvings of China and Japan are counted the finest in the world. Many savage races are skillful in carving, especially the Polynesians, who decorate their canoes, paddles, and huts with finely designed figures. mos are quite skilled in various kinds of carving, especially in making totem posts.

WOODCHUCK (wood'chuk), an animal of the marmot family, which is native to the eastern part of North America, ranging from Ala-



bama to Hudson Bay. The color is blackish above and chestnut-red below. The body is fourteen to eighteen inches long and the tail is bushy. Woodchucks are vegetable feeders, subsisting mostly on plants and fruits, and dig burrows in the ground surrounded at the upper part

by a ridge so water cannot enter. They may be easily tamed and in a domestic state feed on bread and vegetables. In some sections they prove a pest to farmers in that they burrow on hillsides and destroy clover fields. The flesh is quite rank, but is eaten in some localities. The woodchuck is popularly called ground hog. It was formerly supposed that if the sun shines on Feb. 2, or Candlemas Day, so the ground hog may view its shadow, it returns to its burrow and sleeps for six weeks, but, if cloudy weather on that day prevents it from seeing the shadow, it becomes assured that spring is at hand and remains active. Hence, Feb. 2 has come to be called Ground Hog's Day.

WOODCOCK (wood'kok), the name of several birds commonly classed in the same genus as the snipes, but they have a more bulky body and shorter and stronger legs than the true snipes. The American woodcock is about eleven inches long, with an alar extent of eighteen inches. It has a short tail and is of a yellowish-brown color shaded with black. The woodcock frequents fresh-water swamps, where it searches in the water for insects and worms, but its shy habits incline it to spend most of the time during the day in rushes and woods. The flesh is considered a delicacy for the table. These birds have the peculiar habit of occasionally conveying their young through the air, a trait found only in one or two other birds. This is done by the young bird being gently pressed between the feet and against the breast of the parent bird, though sometimes the bill is used to assist in holding the fledgling. Several species of woodcock are native to the Old World. The common European woodcock is somewhat larger than the American. The female measures about thirteen inches in length and is somewhat larger than the male.

WOOD ENGRAVING, the art of cutting figures or patterns on wood, which has long been one of the useful arts. It must be borne in mind that there is an important difference between wood engraving and plate or steel engraving, in that the former has the parts intended to print on the paper in relief, thus resembling ordinary printing type, while the designs in the steel engraving are sunk into the surface. It is not difficult to understand why wood engraving should be the oldest method of making illustrations, since there is but a small step between the ordinary block and the engraved cut, both making an impression on the paper by means of ink. It is thought that block cutting and wood engraving originated in China and that they date practically from the same period. In making wood engravings it is necessary to use a hard and fine-grained wood, Turkish boxwood being the best. The wood is dried thoroughly and cut across the grain, but in large engravings several blocks are joined together. In thickness the block is equal to the length of a printer's type, thus making the engraving fit exactly to the ordinary type used in a printing press. The first step in engraving is for the artist to draw the picture by means of a pencil or brush, which is usually done after a thin coating of white has been applied to the

10.5	
	(3)
*	
+	



(Opp. 3179)

BIRDS CLASSED AS CLIMBERS, Upper View—Mexican Woodpecker, Lower View—Gila Woodpecker,

surface, and the block is then turned over to the engraver. The tools employed by an engraver are made of the finest steel, thus making it possible to maintain sharp edges, a condition essential in producing high-class work. Large engravings are usually in several blocks, each of which is turned over to a special artist, and after the engraving has been completed they are fastened together and used as a single block.

The Chinese are thought to have produced wood engravings ten centuries before the Christian era, but the oldest work of this kind now in Europe dates from 1418. It is preserved in the library at Brussels and represents the Virgin and Jesus surrounded by four saints. Other specimens made in the 15th century are to be seen in Amsterdam, Paris, and Nuremberg. Albrecht Dürer of Nuremberg made many improvements in engraving on wood in the early part of the 16th century, and it is through him that the publication of illustrated books became general in Germany before they were common in other European countries. The finest drawing and engraving are still done in Germany, where many artists find employment in engraving on wood. Besides supplying excellent means of illustrating books and periodicals, there is the additional advantage in wood engravings that they can be duplicated with good results by electrotype and stereotype processes. Within recent years there has been a remarkable tendency to adopt photo-mechanical processes in the preparation of illustrations for books and periodicals, such as the half-tone process. See Engraving.

WOODPECKER (wood-pek'er), a genus of birds belonging to the climbers, so called from their habit of pecking into trees in search of insects. The body is quite slender, the beak is long and powerful, the tongue is pointed, and the tail is stiff. About 350 species have been described, of which about half are found in the New World. These birds are skilled in discovering the holes of insects in trees, at which they peck with sufficient perseverance to make an opening large enough to secure the object sought. The tapping frequently is so vigorous that the noise may be heard at some distance. They commonly cut large holes into partially decayed trees to form nests, in which the female lays from four to six eggs, and in some cases make openings through the outer boards of buildings for the same purpose.

Nearly all the woodpeckers are birds of beautiful plumage, usually having bright markings of red, white, yellow, or green at the head and wings. The red-headed, hairy, three-toed, black, ivory-billed, golden-winged, and yellow woodpeckers are species native to North America. They differ materially in size and habits. The ivory-billed woodpecker is a southern bird. It is twenty inches long, with an alar extent of thirty inches. The red-

headed woodpecker is found in North America from the Atlantic to the Rocky Mountains. It is ten inches long and has a crimson-colored head. The California woodpecker is common to the Pacific coast and is noted for feeding



RED-HEADED WOODPECKER.

chiefly on acorns, which it stores as food in the hollows of old trees. Among the species native to Europe are the great spotted woodpecker and the green woodpeck. The Asiatic hornbill is an allied species of these birds.

WOOD PEWEE (pē'wē), the name of a small bird belonging to the fly-catchers, found on the Atlantic coast from Nova Scotia to the Gulf of Mexico. It has a rapid flight, moving about with sudden darts, especially when in pursuit of insects. The expanse of its wings is from ten to twelve inches. It has a grayish band across the wings, is greenish-yellow below, and utters a slow and somewhat plaintive note, which resembles the sound of pee-a-way. The eggs number four or five, have a light yellowish color, and are characterized by spots at the larger end. This bird migrates toward the south in autumn, usually as far as the West Indies and Central America.

WOODRUFF, Wilford, fourth president of the Mormons, born in Avon, Conn., March 1, 1807; died in San Francisco, Sept. 1, 1898. He was educated at the Farmington Academy and in 1833 was ordained a minister in the Mormon Church. In 1839 he became one of the twelve apostles of the church and ten years later accompanied Brigham Young to Utah, where he became noted as an able and active

preacher. He succeeded to the presidency in 1877, largely because of his great enthusiasm in disseminating the tenets of his church, and administered the office with marked ability and liberality. For 22 years he was a member of the Utah legislative assembly. Though an early defender of the system of polygamy, he announced, in 1890, that the voice of God had commanded the abolition of the practice. Woodruff was not only popular among his people, but his sincerity in support of Mormonism was not doubted by the adherents of other sects. He served on the editorial staff of the Times and Seasons and the Millennial Star. He was succeeded in the office of president by Lorenzo Snow in 1898. The latter was born at Mantua, Ohio, April 3, 1815, and graduated with high honors from Oberlin College. He died on Oct. 10, 1901.

WOODSTOCK (wood'stok), a city of Ontario, county seat of Oxford County, on the Grand Trunk and Canadian Pacific railways. It occupies a fine site on the Thames River, at the point where it receives Cedar Creek, about thirty miles northeast of London. The chief buildings include the county courthouse, the public library, the Oxford Hotel, the Woodstock College, and a number of fine schools and churches. It has manufactures of woolen goods, flour, leather, furniture, and machinery. The public utilities include electric lighting, waterworks, and sewerage. It has a growing trade in farm produce and merchandise. Population, 1901, 8,833; in 1911, 9,320.

WOODWARD (wood'werd), Calvin Milton, educator, born in Fitchburg, Mass., Aug. 25, 1837. He graduated at Harvard University in



CALVIN M. WOODWARD.

1860 and immediately became principal of the Brown high school, Newburyport, Mass., serving until 1865. In the latter year he was elected to a professorship at Washington University, Saint Louis, that of mathematics and applied mechanics, and in 1870 became dean of the school of engineering. He was

one of the organizers of the Saint Louis Manual Training School and for some years served as regent of the Missouri State University, of which he became president in 1904. He published "Manual Training and Education," "History of the Saint Louis Bridge," and "The Manual Training School."

WOODWARD, Robert Simpson, educator, born in Rochester, Mich., July 21, 1849. In 1872 he graduated at the University of Michigan and became assistant engineer on the lake survey of the United States. He was assistant astronomer from 1882 to 1884, serving at the

station in San Antonio, Tex., and later was astronomer to the United States geological survey. He was made professor of mechanics at Columbia University in 1893, later was chosen professor of mathematical physics, and in 1895 became dean of the faculty of pure science. In 1905 he was elected president of the Carnegie Institution, Washington, D. C. Among his publications are many memoirs and papers. He is the author of a text-book for classical and engineering colleges entitled "Higher Mathematics."

WOOL, the soft and curly hair obtained from sheep and some allied animals, used chiefly in the manufacture of clothing. The most noticeable difference between wool proper and hair is in the circumstance that the former is crisped or curly and has minute scales, while hair is usually smooth and straight. When examined under the microscope, it is noticed that the scales extend outward wherever a bend occurs in the fiber, but overlap each other when the fiber is straightened. It is due to this property that woolen threads are inclined to hold together or felt, while the wavy or curly form of the fibers prevents spun threads from untwisting, as is the case with smooth hair. Wool is generally divided into the two classes which are known as short or carding wool and long or combing wool. Carding wool is three to four inches long and combing wool is from four to eight inches. The value depends upon the degree of fineness and softness, but a considerable length is deemed essential to bring the highest market price. Spain has long produced the finest grade of carding wools, owing to its climate being particularly favorable to the merino sheep, but large flocks of merinos are now bred in Germany, Australia, America, and South Africa.

Wool Industry. Wool growing is an extensive industry in Canada and the United States. The latest estimates place the number of sheep in Canada at 2,685,000 and in the United States at 56,184,500. At present the annual clip of wool in the United States aggregates 300,-550,000 pounds. This immense quantity of wool is not sufficient to supply the demand, hence about 142,500,000 pounds are imported annually, though the importations are mostly fancy grades. The total wool production of the world is placed at 2,910,104,500 pounds. Wool is supplied by the Rocky Mountain, Angora, and Cashmere goats. The beaver and some other animals have a growth of wool under the hair. Wool ranks next to cotton in the quantity consumed as a material for making clothing. It is shorn off the sheep and goats at different seasons of the year, this depending on climatic conditions, but generally the clippings are made in the spring.

In most countries the sheep are washed in a large bath or tank before being sheared, thus removing a part of the dirt from the wool. After shearing, the wool is separated into different grades, depending on the softness and length, and is then carefully washed and dried.

In most cases the washing and cleansing is done at the factory, where suitable machines are employed for the different processes. Some wool is dyed immediately after cleaning, while in other cases it is manufactured into cloth and left undyed, as some flannels, or it is dyed in the piece. Wool is subjected to many processes before it is spun into threads, including dusting, scouring, and picking to remove the burs which still cling to it. It is then passed through the carding machines, by which it is further cleaned and formed into untwisted yarn, somewhat larger in size than ordinary yarn, after which it is placed on spools. When in this condition it is ready to be spun into a fine, firm thread for weaving. The cloth is scoured shortly after weaving to remove the oil and dirt still remaining, when it undergoes the fulling process, by which it is shrunk to form a more compact body. In fulling, the cloth loses ten to twenty per cent. of its width, and length, but becomes much thicker.

The cloth is usually passed over frames in the burling room to remove broken threads and some cloths undergo teaseling, by which fine threads are raised on the surface and, after cutting them, they form the nap, the inclined and projecting fibers of thread on the surface, as in flannel, hats, and various fabrics. The finished cloth is usually made into fifty-yard bundles, in which form it comes through the wholesaler to the retailer. The many kinds of woolen goods are divided into broadcloths, so called because they range in width from 56 to 60 inches, and narrow cloths. Beavers, cloakings, and meltons are among the broadcloths, while flannels, cashmeres, upholstery goods, doeskins, and blankets are included among the narrow cloths and are usually about 27 inches wide. Many manufacturers produce various kinds of woolens and make a difference in the material used. Thus, some goods are made entirely of wool, while others are partly of wool, containing either cotton, linen, or silk, or they may be made of a mixture of the different kinds of materials. Worsted goods are so named from being first manufactured in Worsted, England, and differ from other woolens in being made of a harder spun and stronger yarn. Formerly the spinning and weaving of woolens were slow processes, but with the improved machinery now in use it is possible for one man to do ten to fifteen times the work accomplished by a laborer of a hundred years ago. Australia is the greatest wool-producing country in the world and next to it rank Argentina, the United States, Russia, Great Britain, France, Spain, Uruguay, India, South Africa, Austria, Germany, and Turkey. However, the manufactures of woolen products are differently distributed, being largest in the United States, Germany, and Great Britain.

WOOL, John Ellis, soldier, born at Newburg, N. Y., Feb. 20, 1784; died Nov. 10, 1869. He studied law and engaged in the book business in Troy, but entered the army in 1812. Gallant services at Queenston Heights caused him to be promoted to the rank of major. In 1816 he was made a colonel, which position he retained until 1841, when he was appointed brigadier general. During the Mexican War he fought under General Taylor, whom he succeeded in command of the army, when the latter returned to the United States. At the beginning of the Civil War he was placed in command at Fortress Monroe and in 1862 he occupied Norfolk and Portsmouth. He continued in active service until 1863, when he was retired with

the rank of major general.

WOOLSEY (wool'si), Theodore Dwight, educator and author, born in New York City, Oct. 31, 1801; died in New Haven, Conn., July 1, 1889. He graduated from Yale in 1820, studied law in Philadelphia, and afterward took a course in theology at Princeton. After serving as tutor at Yale for two years, he studied three years in the German universities of Bonn, Leipsic, and Berlin. In 1831 he became professor of Greek in Yale University, where he labored successfully for fifteen years, and in 1846 was chosen president of that institution. He held that office for 26 years and in the meantime greatly improved its courses and enlarged the influence of the university. From 1871 to 1881 he was president of the American committee that aided in revising the New Testament. He was the founder of the New Englander and published works entitled "Political Science," "Study of International Law," "Communism and Socialism in Their History and Theory," and "Helpful Thoughts for Young Men." Series of articles written by him were published in the New American, the Princeton Review, and the Cen-

WOOLWICH (wool'ich), a borough of London, England, formerly a town in Kent County, nine miles east of Saint Paul's Cathedral. It extends along the Thames River for three miles and has mostly narrow and irregular streets. The borough has extensive railroad facilities and steamboat connections with other trade centers, but its chief importance is due to the arsenal, which covers about 600 acres and includes barracks, gun factories, and ordnance departments. It is the seat of the Royal Military Academy and has extensive docks. About 10,000 men are employed at the arsenal. On the opposite side of the Thames is North Woolwich, which has extensive manufacturing establishments, especially of telegraph cables and earthenware. Population, 1911, 121,403.

WOONSOCKET (woon-sok'et), a city of Rhode Island, in Providence County, on the Blackstone River, forty miles southwest of Boston, Mass. It is on the New York, New Haven and Hartford Railroad and on several electric railways. The noteworthy features include the Harris Institute Library, the public high school, the Sacred Heart College, the

soldiers' monument, and three parks. It has manufactures of cotton and woolen textiles, rubber goods, hardware, musical instruments. machinery, and farming implements. Gas and electric lighting, street pavements, and sanitary sewerage are among the improvements. Near the city is Woonsocket Hill, an elevation 580 feet above sea level, which is the highest point in the State. The place was incorporated as a city in 1888. Population, 1910, 38,125.

WOOSTER (woos'ter), a city in Ohio, county seat of Wayne County, fifty miles southwest of Cleveland, on the Pennsylvania and the Baltimore and Ohio railroads. The surrounding country has productive limestone quarries and bituminous coal mines. the noteworthy buildings are the county courthouse, the high school, the public library, the University of Wooster, and the Ohio Agricultural Experiment Station. It has manufactures of furniture, engines, paints and varnish, farming implements, and machinery. The place was platted in 1808 and named in honor of General Wooster. It was incorporated in 1868. Population, 1900, 6,063; in 1910, 6,136.

WOOSTER (woos'ter), David, soldier, born in Stratford, Conn., March 2, 1710; died May 2, 1777. He graduated from Yale in 1738 and the following year entered the army with the rank of lieutenant. In 1745 he commanded the Connecticut, a vessel conveying the troops to the siege of Louisburg. He served as brigadier general in the French and Indian War and in 1775 aided in capturing Ticonderoga. Subsequently he commanded a brigade in the continental army, served on an expedition in Canada, and after the death of General Montgomery had chief command. In 1777 he was appointed brigadier general of the militia and commanded at Danbury. While defending that town against the English under Gov. William Tryon, on April 26, 1777, he rallied his men, exclaiming, "Come on, my boys! Never mind such random shots," but was severely wounded and died shortly after. In Danbury is a fine monument of Portland granite, which was erected to his memory in 1854.

WORCESTER (woos'ter), a city of Massa-chusetts, one of the county seats of Worcester County, 43 miles west of Boston, on the Boston and Maine, the Boston and Albany, and the New York, New Haven and Hartford railroads. Interurban electric railways furnish communication with Boston and many other cities. It is conveniently situated on the Blackstone River and is surrounded by a fertile farming country. The streets are handsomely paved and otherwise improved by waterworks, public parks, gas and electric lighting, and an extensive system of street railways. Among the chief buildings are the State normal school, the Clark University, the Worcester Polytechnic Institute, the Baptist Academy, the Odd Fellows' Home, the College of the Holy Cross, the Highland Military Academy, the public library with 140,000 volumes, the

United States post office, and many fine public schools and churches. It is the seat of two State lunatic asylums, an industrial school, a military institute, and many hospitals and charitable institutions.

Worcester is important as an industrial and wholesaling center. It has one of the largest wire factories in the world. Among the general manufactures are boots and shoes, yarn, cotton and woolen fabrics, clothing, ironware, belting, wire, furniture, needles, flour, and machinery. Many tourists visit the city. It has fine resorts, both within the city and in the vicinity, including those at Mount Wachusett and at Lake Quinsigamond. The place was first settled in 1673, but the settlement was abandoned at the beginning of King Philip's War, and a permanent settlement was established in 1713. It was incorporated as a town in 1722 and was made a city in 1848. Population, 1905, 127,-763; in 1910, 145,986.

WORCESTER, a city of England, in Worcestershire, 110 miles northwest of London. It is conveniently located on the Severn and has good railroad facilities. The chief building is its cathedral, founded by Archbishop Theodore in 673, but subsequent additions and modifications have been made at different times. Other noteworthy buildings include the corn exchange, the shire hall, the museum of natural history, and several schools and churches. Worcester is noted for its extensive manufacture of leather gloves. It has manufactories producing carriages, porcelain goods, textiles, spirituous liquors, engines, and machinery. Worcester was founded by the ancient Britons and was rebuilt in 894, after being destroyed by the Danes. In 1651 it was the scene of a noted battle, in which Cromwell routed the royalists under Charles II.

Population, 1911, 47,987.

WORCESTER, Joseph Emerson, author, born in Bedford, N. H., Aug. 24, 1784; died in Cambridge, Mass., Oct. 27, 1865. After graduating at Yale University, in 1811, he became a public school teacher at Salem. In 1819 he settled at Cambridge, where he devoted himself to literature. He visited Europe in 1830 to consult some of the famous libraries with the view of publishing a comprehensive dictionary and in 1850 completed the well-known Worcester's Dictionary of the English Language. Subsequently this work was greatly enlarged. It is still a standard in many schools and institutions of higher learning. In its present form it constitutes one of the most complete works of its kind ever published. Worcester lectured extensively, published a number of geographies and histories, and contributed to many standard periodicals. He was granted a degree by Brown University in 1847 and by Dartmouth in 1856. His publications include "Elements of Geography, Ancient and Modern," "Epitome of History," "Outlines of Scripture Geography," and "Sketches of the Earth and Its Inhabitants,"

WORDEN, John Lorimer, naval officer, born in Westchester County, New York, March 12, 1818; died in 1897. He joined the navy as midshipman in 1834, was commissioned a lieutenant in 1846, and commanded the Monitor in the fight against the Merrimac, or Virginia, on Hampton Roads in 1862. During the engagement his sight was injured by a shell, but he was on duty at New York and in the Pacific squadron until after the war, when he was promoted to the rank of commodore. In 1870 he was made superintendent of the Naval Academy at Annapolis, Md., and two years later was commissioned rear admiral. He commanded the European squadron from 1875 until 1877 and retired in 1886 at his own request.

WORDSWORTH (wurdz'wurth), William, eminent poet, born at Cockermouth, England, April 7, 1770; died April 23, 1850. His father was an attorney at law and provided for his elementary education at Hawkshead. In 1791 he graduated from Cambridge University and shortly after made an extensive tour of France. While there he studied the French language and sympathized with the revolutionists, but returned to England after remaining abroad a year. In 1793 he published two poems entitled "Descriptive Sketches" and "An Evening Walk." Raisley Calvert left him a legacy of \$4,500, a sum deemed of much value at that period of his life, and he was requested by his benefactor to engage in literary work. He settled with his sister in Somersetshire, where he was visited by Coleridge in 1797. The two became close friends, and, with the object of securing the funds to make a tour of Germany, they formed a partnership to publish a volume of poetry under the title "Lyrical Ballads." Coleridge contributed "The Ancient Mariner" to this little volume, while Wordsworth supplied the other pieces, but the latter was censured considerably for using commonplace terms. His contributions to this work included, besides a number of others, "Lines on Tintern Abbey" and "We are Seven."

After returning from Germany, Wordsworth and his sister settled at Grasmere, in the lake district. Coleridge and Southey resided near them and the three came to be spoken of as the Lake School Poets. Not disheartened by the unappreciative reception of his former works, Wordsworth devoted himself with great energy to embody his peculiar views of poetry. In 1802 he received \$42,000 on a debt due to his father at the time of his death and in the same year married his cousin, Mary Hutchinson. He was appointed inspector of stamps in 1813 and shortly after made several tours into Scotland and on the continent. Oxford University bestowed a degree upon him in 1839 and on the death of Southey, in 1843, he was made poet laureate. Although his writings were adversely criticised for many years, he has come to be regarded among the greatest poets of England.

His numerous works include "The Female Vagrant," "The Last of the Flock," "Lines to Westminster Bridge," "To a Highland Girl," "Excursion," "Ode on the Intimations of Immortality," "The Deserted Village," "White Doe of Rylstone," "Song at the Feast of Brougham Castle," "The Traveler," "Yarrow Revisited," "The Borderers," and "Memorials of a Tour on the Continent."

WORKHOUSE, an establishment maintained for paupers, in which minor offenders are detained for a short time. The term applies in England to houses of correction that are maintained by the authorities to segregate paupers from others, and here they are required to work as a means of reform or as a punishment for some minor offense. In the United States the name is sometimes applied to places where vagrants and drunkards are confined at work, but such establishments are more generally spoken of as houses of correction. Workhouses have been a prolific means of suppressing vagrancy in England, especially under a general act of Parliament passed in 1782, which induced a dread that stimulated the poor to provide for themselves. Such establishments usually give secular and religious instruction and enforce the habits of cleanliness and industry. Those who are confined to the workhouse are usually unable to pay a nominal fine, and the expense of keeping them is at least partly compensated for by the labor they are required to do in confinement.

WORLD'S COLUMBIAN EXPOSITION, the official name of an international exhibition held in Chicago, Ill., in 1893, to commemorate the discovery of America by Columbus in 1492. The idea of holding such an exposition was suggested by Alexander D. Anderson, secretary of the board of trade at Washington, D. C., who published his approval of the enterprise as early as 1884. Subsequently he was joined by others in a movement to secure the recommendation of Congress favorable to such a celebration. At the instance of Senator Hoar the Library Committee of the United States Senate recommended the promotion of the enterprise. In 1890 Senator Cullom of Illinois introduced a bill favorable to the holding of the World's Columbian Exposition in the year 1892, which bill was soon after passed by both houses of Congress. The city council of Chicago had already authorized Mayor Cregier to appoint a committee of one hundred citizens, of which Lyman J. Gage was made chairman, the object being to promote interest in the exposition and to urge the claims of Chicago to its being made the site. Other cities, including New York, Washington, and Saint Louis, entered into the competition, but the exposition was awarded to Chicago, which city was designated the seat of the same by an act of Congress.

The site of the exposition comprised 666 acres. It was mainly in Jackson Park, a fine tract of land on the shore of Lake Michigan, situated

about six miles south of the mouth of the Chicago River, now the Chicago Drainage Canal. To it was added a boulevard connecting Washington and Jackson parks, which was 600 feet wide and was known as the Midway Plaisance. It required about two years to improve the grounds and construct the buildings, which were among the finest and certainly the most elaborate of their kind ever erected in the world. The many beautiful structures resembling marble in appearance caused the grounds to be called the White City. However, it was necessary to postpone the celebration until 1893 and on May 1 of that year the opening ceremonies took place. Grover Cleveland, President of the United States, delivered the dedicatory address and touched the electric button that set all the machinery in motion. The chief officers were George R. Davis, director-general; Thos. W. Palmer, president of the national commission; and H. N. Higginbotham, president of the Columbian Exposition Company.

The grand court of the exposition presented the finest aspect ever witnessed in America. It was beautified with exquisite architecture, sparkling fountains, extensive canals and lagoons, and masterful works of sculptured art. The building devoted to manufactures and liberal arts was the most extensive, covering an area of about forty acres. In it were exhibited the products of the skill and ingenuity of all the nations and peoples of the world. Other structures worthy of special mention included those containing the exhibits classed as representing mines and mining, electricity, horticulture, agriculture, live stock, machinery, fisheries, forestry, etc. The states and territories made elaborate displays, for which purpose many of them expended large sums of money. Those appropriating \$200,000 or more for that purpose are Illinois, \$800,000; New York, \$600,000; California, \$550,000; Pennsylvania, \$360,000; Michigan, \$275,000; Wisconsin, \$212,000; and Ohio, \$200,-000. Forty-one nations and colonies were represented at the exposition, which included all the civilized peoples and many of the barbarian. Foremost among those making elaborate displays were Canada, Germany, France, Mexico, Russia, Spain, Great Britain, and Italy.

The total assets of the World's Columbian Exposition were officially reported at \$28,151,-168.75 and the total attendance was placed at 27,539,021, the latter number including free admissions. In October the receipts were \$3,195,-670 and the attendance in the same month was 7,945,430, this being the best record for any one month. Chicago Day witnessed the largest attendance, the number being 716,881. It was estimated that 11,250,000 different persons attended the exposition from its opening until it closed on October 30, 1893. While the receipts for all purposes were about equal to the expenditures, the income from concessions and gate receipts was \$14,117,332. See Exposition.

WORMS (vorms), a city of Germany, in the grand-duchy of Hesse, on the Rhine River. It is one of the oldest cities in Germany and its history is of much interest. The general aspects have been changed materially within recent years, owing to the construction of a number of important railway lines and the addition of many modern facilities. The streets are paved substantially and are improved by drainage, waterworks, gas and electric lighting, and an extensive system of rapid transit. It has manufactures of pottery, musical instruments, polished leather, tobacco products, wines, and machinery. Among the interesting buildings is a cathedral in the Byzantine style, dating from the 8th century. The Liebfrauenkirche is a It has a number of fine beautiful church. schools, a gymnasium, the town house, and the Saint Martin Church. Worms is connected with many of the incidents mentioned in the Nibelungenlied. During the Roman occupation it was an important military point. Attila destroyed it, but it was rebuilt by Clovis and was long a residence of Charlemagne. Henry V. made it a free imperial city. Several important diets convened at Worms, at one of which Luther appeared in defense of the Protestant faith before Charles V. and the imperial princes. This event is commemorated by an imposing monument to Luther, unveiled in 1868. The city suffered greatly in the Thirty Years' War, but within recent years has shown evidences of returning importance. Population, 1915, 43,841.

WORMS, or Vermes, the lowest class of articulated animals, which are characterized by elongate, flattened, or cylinderical bodies. The name is loosely applied to a large number of forms that do not have many features in common, but some writers restrict the group to those that have a digestive tract with two openings, the mouth and the anus, and which have a blood-vascular circulatory system. In most forms the nervous system has a principal center above the throat, the body cavity is present, and the excretory organs are simple. The name worms is applied to many entozoa that are found in the intestines of the human body. These animal forms may occur at any period of life, but are most frequent in young children.

WORMWOOD (wûrm'wood), a class of plants, which have an erect, angular, and shrubby stem and yellowish flowers. A number of widely diffused species have been catalogued, of which the common wormwood of Europe is the best known. This plant is now naturalized in Canada and the eastern part of the United States. Its leaves are aromatic and yield a bitter tonic employed as a vermifuge and to protect clothing and furniture from moths and other insects. The Roman wormwood is native to Germany and has properties similar to those of the common wormwood. A tall greenhouse annual known as wild wormwood is native to the West Indies and is allied to the feverfew.

WORSTED (wust'ed), the name applied to several varieties of woolen yarn or thread, so named from Worsted, England, where it was first manufactured. A fine and soft worsted woolen yarn, untwisted or lightly twisted, is used in knitting and embroidery. Long staple wool is employed to spin a well-twisted worsted yarn. This product is used in making gloves, carpets, hosiery, and cloth. Worsted goods of this class are produced largely from wool that has been combed carefully so that fibers lay parallel to each other.

WORTH, William Jenkins, soldier, born in Hudson, N. Y., March 1, 1794; died May 7, 1849. He distinguished himself in the War of 1812, was made captain in 1815, and commanded a department at the time of the insurrection on the border of Canada, in 1838. Later he fought against the Indians and in the Mexican War and was prominent in the battles of Monterey, Cerro Cordo, Chapultepec, and the City of Mexico. Congress presented him with a sword of honor for his services at Monterey, and he was similarly honored by the states of New York and Louisiana. A monument was erected to his honor at the junction of Broadway and Fifth Avenue, New York.

WOUND, the name applied to any incision, or puncture, in the fleshy part of the body, especially to an injury where the tissues are divided by mechanical force. Injuries of this kind are termed penetrating, when a cavity is cut into the body without passing through it, and perforating, when they form an opening through the body or through a particular part of it. Sharp-edged instruments cause wounds that are classed as cuts or incisions, while pointed weapons thrust into the body produce stabs or punctured wounds. Animal venom or virus as well as poisonous matters produce poisoned wounds, while those caused by dull instruments are usually classed as lacerated wounds. Injuries resulting from gunshot are usually penetrating and sometimes lacerated. They are usually dangerous because of the complications that may arise.

Wounds may be said to have a local and a general effect. The local symptoms consist of pain, bleeding, and impairment of function, while the general effect includes a shock upon the nervous system and injury by excessive bleeding. Later other complications may set in, such as inflammation, gangrene, and bacteria. The first object in the treatment of a wound should be to stop the bleeding, which may be done by bandaging so as to compress the vein or artery that has been opened. The next step is to wash the affected part with warm water, bathe with an antiseptic, such as a solution of boric acid, and then bandage with light cloth or gauze. It is necessary to disinfect and redress the wound from time to time, and it should be kept entirely free from foreign matter and impurities. Where the ruptured nerves and blood vessels remain in close contact, healing takes place rapidly by what is termed primary adhesion, or first intention, but when the edges of the wound are left apart the healing is by secondary intention, or granulation.

WRANGLER (răn'glēr), the term applied to a student who attains the first class in the mathematical honor in examination in the University of Cambridge, England. Any number of students may attain to the honor of wrangler, but the one who makes the best record is called the senior wrangler. The examination is public and the honors are commonly called mathematical tripos.

WREN (ren), the common name of several kinds of small birds related to the warblers. Most species are native to America, but birds



of this class are found in abundance in the Old The house wren of Canada and the United States builds its nest near houses and in boxes placed for it in house yards. It is about five inches long with an alar extent of ten inches, has a reddish-brown color with whitish markings below, and is known to have great valor in defending its nest against other birds. Two broods of young are reared in a season. This species of wren is a very common kind of birds and has a beautiful song. Other familiar species include the marsh wren, winter wren, and Carolina wren. The common European wren is somewhat smaller, being about four inches in length, and with the exception of the golden-crested wren is the smallest bird in Europe. Nearly all the wrens are similar in being rather bold and having a slender bill, short wings, and a short and erect tail.

WREN, Sir Christopher, architect, born in East Knoyle, England, October 20, 1632; died February 25, 1723. He graduated from Oxford

University and in 1657 became professor of astronomy at Gresham College. Wren, being of an inventive turn of mind, devised various mathematical instruments, including a set of globes to teach the phases of the moon and several notable improvements on the barometer. Charles II. chose him, in 1663, to make designs for restoring Saint Paul's Cathedral in London, but that building was destroyed by fire in 1666 and Wren was commissioned to rebuild the cathedral. Though hampered in preparing his plans by the ecclesiastical authorities, he was afterward permitted by the king to make a number of modifications and improvements in the designs. The new building was begun in 1675 and completed after 35 years' work, Wren witnessing the laying of the last stone by his son. Other notable buildings designed by Wren include the Royal Observatory at Greenwich; Pembroke College, Cambridge; the Hospital of Chelsea; the campanile of Christ Church, Oxford; the towers of the west front of West-minster Abbey; and the churches of Saint Michael, Saint Stephen, and Marylebone. He was chosen president of the Royal Society in 1680 and was a member of Parliament from 1685 to 1700. Charles II. knighted him in 1673. He was buried at Saint Paul's, where his tomb bears the inscription, Si monumentum requiris, circumspice, meaning, if you seek his monument, look around.

WRESTLING (res'ling), an athletic sport between two persons, each of whom endeavors to force his antagonist to the ground without resorting to kicks or blows. It is one of the most universal of athletic exercises and is a trial of both skill and strength. The Greeks greatly encouraged wrestling as a gymnastic exercise and the victors at the Isthmian, Nemean and Olympic games who excelled in this sport received the highest honor. It was cultivated extensively by the Romans, but their contests were more savage and brutalizing than a fair test of wrestling. The sculptures obtained from Egypt make it evident that wrestling was practiced at a very early date. However, the ancient wrestler was almost nude and covered his body with oil, thus to render himself more subtle in combat with his opponent. This practice made it very difficult to get a firm hold of one another and the wrestlers were permitted to use sand on their hands. They took hold of each other by the arms, employed many contortions of the body, interlocked their limbs, and used other similar methods to cause the opponent to be thrown to the ground.

Modern wrestling has been reduced to a skill-ful art and the rules for this sport are very numerous and quite elaborate. The catch-ascatch-can system places the antagonists in an open space facing each other, and at a given signal permits them to move in close contact and take any hold they may choose. In the system of collar and elbow wrestling, the op-

ponents face each other and at the signal make the attack by seizing hold by the collar and at the elbow. A contestant is not considered down unless both shoulders and one hip, or both hips and one shoulder touch the ground, which is decided by an umpire. If a contestant, to save himself from a fall, loosens his hold with one or both hands, it is counted against him as a fall. A contest consists of three or five falls, each being succeeded by an intermission of fifteen minutes.

Another system is the back-hold catch, in which the opponents stand close together, facing each other, but in such a position that the chins rest on the shoulders of the opponents. Wrestling begins at a signal and any method of throwing, except kicking or brutality, may be employed. To win the contest, it is necessary to throw the opponent so both shoulders will touch the carpet. Other systems include the hammerlock, the half-Nelson, the Cornwall and Devon, and the Lancashire style. Jiu-jutsu is a system of Japanese wrestling, but the methods employed Tokio alone has forty are very numerous. schools in which this form of wrestling is taught, but they all differ in some minor respect, and many others are practiced in different parts of that country

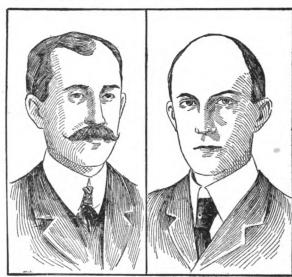
WRIGHT (rit), Carroll Davidson, statistician, born in Dunbarton, N. H., July 25, 1840; died Feb. 20, 1909. He attended an academy and began the study of law, but soon joined the Federal army. His services in the Civil War caused him to be promoted to the rank of colonel and after the war he was admitted to the bar. In 1873 he was made chief of the Massachusetts bureau of labor statistics, became chief of the United States Bureau of Labor in 1884, and became the head of the Department of Labor in 1888. He published a number of authoritative works on labor and economic questions and became noted as a statistician and investigator of social problems. Andrew Carnegie appointed him as trustee of the Carnegie Institution. In the meantime he held several positions in educational institutions, including the presidency of the college department of Clark University. His publications include "Convict Labor," "Factory System of the United States," "Relations of Economic Conditions to the Causes of Crime," "Strikes and Lockouts," "Relation of Political Economy to the Labor Question," "Scientific Basis of Tariff Legislation," and "Hand Labor in Prisons."

WRIGHT, Horatio Governeur, soldier, born at Clinton, Conn., March 6, 1820; died July 2, 1899. He graduated at West Point in 1841, served as an engineer for six years, and held an official position at Washington until the beginning of the Civil War. In 1861 he was chief engineer at the first Battle of Bull Run, was commissioned brigadier general the same year, and was placed in command of the Port Royal expedition. The following year he captured

3187 WRIT

Jacksonville and Saint Augustine, Fla., and soon after took command of the department of the Ohio. In the Battle of Gettysburg he led a division, took part in the campaign against Petersburg, and was called to defend Washington against the threatened attack under General Early, whom he defeated at Snicker's Gap. At the close of the war he was mustered out of the volunteer service and took up engineering. His efficient services at the capture of Petersburg caused him to be promoted to the rank of major general. He retired from active service in 1884.

WRIGHT, Orville and Wilbur, inventors and aeronauts, sons of Milton Wright, a bishop of the Church of United Brethren in Christ. Orville was born at Dayton, Ohio, on Aug. 19,



ORVILLE WRIGHT.

WILBUR WRIGHT.

1871, and Wilbur was born near Millville, Ind., on April 16, 1867. The latter died at Dayton, O., May 30, 1912. They began to study balloons and the general subject of aviation at an early age. In 1896 they established a small shop in Dayton, Ohio, where they repaired and built bicycles, but gave the greater share of their time to the production of a flying machine. As early as 1903 they produced a machine which was heavier than the air and would remain in the air about two minutes. Two years later they improved this machine so they could rise or descend with it at will, although it remained in the air only a few minutes. In 1908 they succeeded in producing the first of their numerous heavier-than-air machines which enabled them to make very satisfactory tests, both in Europe and America. Orville Wright made a famous test of the Wright aëroplane at Fort Myer, Va., in that year, when he made a record of 40 miles per hour, remaining in the air 1 hour, 14 minutes, and 20 seconds. Wilbur Wright surpassed this record in his flights in France, remaining in the air more than two hours. It has been proven by subsequent tests that the Wright machines were among the most serviceable produced up to 1912.

WRIGHT, Luke E., public man, born in Memphis, Tenn., in 1847. He was educated under private tutors, became a member of the bar at Memphis, and practiced his profession with eminent success. From 1880 to 1888 he was attorney general of Tennessee, supported the candidates of the Gold Democratic party in 1896, and was appointed by President McKinley in 1900 as a member of the commission to establish civil government in the Philippines. While Governor Taft was absent from the Philippines on a trip to the United States and Europe, in 1902, he was acting governor and in 1903 was

appointed Governor of the Philippines. He published a number of pamphlets and numerous magazine articles relating to jurisprudence and the colonies.

WRIGHT, Silas, statesman, born at Amherst Mass., May 24, 1795; died Aug. 27, 1847. He studied law and began to practice at Kenton, N. Y. In 1823 he was elected to the State senate as a Democrat, where he formulated a financial policy that he supported throughout his public career. He became comptroller of New York in 1829 and United States Senator in 1833, and in the latter capacity he supported the policies of Andrew Jackson. In 1844 he was chosen Governor of New York and as such took a decided ground against the antirent rioters. In 1846 he retired from public service, having declined a seat in the Cabinet of President Polk.

WRIT, a written order issued by the authority of a state or province, requiring a person to do something men-

tioned in the same. Such a document is issued by a court or some other official and the person commanded to act is required to appear at the time or place mentioned, or do whatever may be directed. A writ is issued under the seal of a public official and it is served, or executed, by the sheriff or some other similar officer. A writ of mandamus commands a person or inferior court to do a duty or fulfill an obligation; of injunction, restrains action; of error, requires the removal of a cause from a lower to a higher court to correct an error; of subpoena, commands the attendance of a witness; of ejectment, removes an occupant from certain premises; of replevin, permits the recovery of goods taken illegally; of certiorari, requires the record of a cause to be sent for review from an inferior to a higher court for examination; of quo warranto, requires an official to show by what right an office is held or an act is done; of attachment, directs taking property into custody by virtue of a legal process; and of habeas corpus, has for its object to bring a party before a court or judge, especially one to inquire into the cause of a person's imprisonment.

WRITING, the art of recording ideas on paper, stone, parchment, or any other material by means of letters and characters. The art of writing is usually divided into ideographic, in which ideas are represented by signs, and phonographic, in which letters or signs are used to represent sounds or words. Writing was introduced into Europe from Phoenicia, which derived its system from the Egyptians. The Egyptian system was hieroglyphic, in which it was attempted to convey ideas by copying objects direct from nature. For this reason it is sometimes called picture writing. The characters used were afterward supplemented by a number of arbitrary signs; hence the Egyptian system became both ideographic and phonographic.

It is generally assumed that all alphabets are of hieroglyphic origin and that all systems of writing originated from four or five distinct hieroglyphic systems. These include the Egyptian, the Chinese, the cuneiform, the characters originally used in Yucatan, and the Aztec or Mexican. However, the Egyptian system has been the most potent in influencing the writing systems now employed, though there is still a question as to whether the cuneiform or the Egyptian is of the greater antiquity. The Latin, Greek, Sanskrit, and all European languages are written from left to right, but the Hebrew is written from right to left, while the Chinese signs or symbols are read in columns from top to bottom. No alphabet is employed in the mode of writing used by the Chinese. Their system is strictly ideographic, the characters are syllabic, and the words are monosyllabic. About 40,000 characters make up the Chinese system. The Sanskrit alphabet is the most perfect known and is made up of 14 vowels and 43 consonants.

Capital letters were not employed to distinguish prominent words until after mediaeval times. In the period from the 4th to the 8th century uncial letters were used principally in manuscripts. These were large and of nearly uniform size, resembling modern capitals, but they were characterized by greater roundness. In the 13th century the Gothic characters, differing slightly from the Roman types, came into general use in writing church books, but this form was supplanted largely in Saxony and other regions of Germany by the Saxon style. The Saxon style was introduced in England by the Saxon conquerors, but was afterward modified by the Roman, Lombardic, and other characters. It continued in general use until the time of George II., when it was abolished by law and the present Latin system was introduced. An improved form of the Saxon style is now employed by the Germans, Scandinavians, and other classes. Attempts to introduce systems of phonetic writing have been made at various times, and it is still the hope of many educators to devise a method in which an invariable sign will represent each sound. The phonetic idea is exemplified in many systems of shorthand writing.

WRITING

Two distinct systems of penmanship are generally taught in the English and American schools which are known as the slant and vertical. Until recently slant writing was employed almost universally and it is now taught most extensively, but vertical penmanship has been adopted in many schools, both public and private. The advocates of vertical writing, a sample of which is shown in the figure, make the

Vertical Writing

claim that it so nearly resembles the forms employed in printing that the learners are able to read it as readily as print. However, makers of text-books have originated various styles of vertical writing, some differing but slightly from the slant. As a general rule beginners write more legibly in the vertical hand, but they do so at a loss of speed. Seven principles are employed in slant writing, as shown in the illustration. These are known respectively as slant line, left curve, right curve, extended loop, direct oval, reverse oval, and capital stem. They are numbered from left to right, as 1, 2, 3, 4, etc. The fifth is the capital letter O, and all other letters are formed by combining two or more of the other six principles.

1111010

PRINCIPLES OF SLANT WRITING.

Three essentials should be made objective in teaching and studying penmanship. They are legibility, rapidity, and beauty, but of these the first two are the most important. Both legibility and rapidity depend upon constant practice, but it is highly essential that learners acquire the



HOLDING THE PEN.

habit of holding the pen correctly and of sitting properly at the desk. The feet should rest squarely on the floor and the desk and seat need to be of the proper height, else the pupil will be hindered in the free use of the muscles of the arm and hand. It is best to hold the pen loosely, as a firm grasp tends to tire the muscles, causing them to become overtaxed and unsteady. Little progress can be made until the eye becomes trained to perceive and judge of correct and beautiful forms and the hand has had sufficient practice to execute and produce them correctly. To do this pupils need adequate supplies, such as good pens, practice paper, copy books, and a superior grade of black ink. A definite period each day should be set apart to practice penmanship and the work needs to be done with care, else the progress will not be material and the copy books may become disfigured by blots. To teach writing successfully, one needs to be a good penman and a careful student of the movements employed by the learner.

WRITS OF ASSISTANCE, the warrants issued by the courts of revenue officers to enforce the navigation and revenue laws in the American colonies. Parliament passed an act providing for these writs, in 1754, and they were further legalized in 1766. They differed from an ordinary search warrant in that they were not limited as to time for making an inspection of the premises for goods, and it was not required to specify the premises where search was to be made. Much objection was raised by the colonists, since the general terms of the warrants made it possible to abuse the liberty of the subjects. James Otis argued against such writs before the superior court of Massachusetts in 1761, but they were held to be legal. Subsequently

they were rarely issued.

WRYNECK (ri'něk), the name of a small bird of the woodpecker family, so called from its peculiar habit of twisting the neck in a serpentine manner. The body is about seven inches long, has a rusty ash color, and is marked by irregular spots of brown and black. The common wryneck of Europe is migratory. It moves north in the spring as far as Great Britain and Russia and feeds upon ants and other insects. Several

species are found in Africa.

WUNDT (voont), William, sociologist and philosopher, born at Necharau, Germany, Aug. 16, 1832. He was educated at Heidelberg, Tübingen, and Berlin, received degrees in law and medicine, and in 1857 became teacher of physiology at Heidelberg. In 1865 he was made professor of philosophy at Zurich and later held a similar position at Leipsic. He published many works and may be regarded the leading representative of modern psychology among the educators of Europe. His chief works are "Theory of the Movement of the Muscles," "Lectures in Human and Animal Psychology," "Handbook of Medical Physics," "An Investigation of the Facts and Laws of the Moral Life," "System of Philosophy," "Outline of Psychology," and "Popular Psychology."

WÜRTTEMBERG (vürt'tem-berg), a kingdom in southern Germany, lying between Hohenzollern, Baden, Bavaria, and Lake Constance. It

is separated from Switzerland by Lake Constance, a beautiful sheet of fresh water. length is 138 miles; width, 106 miles; and area, 7,535 square miles. It is chiefly an agricultural region, about two-thirds of the entire area being under cultivation, and fully three-tenths is covered with forest. Ranges of the Alps cross the southern part, and in the interior are the Hohenstaufen Hills. It has fine forests of pine, oak, beech, and other valuable timber. The mineral deposits include gypsum, copper, coal, iron, bismuth, cobalt, limestone, salt, and granite. The climate is highly favorable to the cultivation of cereals and fruits and is exceptionally healthful. Wheat, corn, rye, hay, barley, hops, tobacco, and vegetables are the principal productions. vineyards yield large quantities of excellent grapes, which are made into Rhine and Champagne wines. Live stock of all kinds is abundant. especially milch cows, horses, cattle, and swine. The manufactures include ironware, clothing, woolen and silk textiles, beet sugar, spirituous liquors, chemicals, scientific instruments, and machinery. Navigation facilities are provided by several canals in connection with the Danube and Neckar rivers, but extensive railroad facilities are maintained in all parts of the country. The chief cities include Stuttgart, Ulm, Heilbronn, and Esslingen.

Württemberg is a constitutional kingdom. The sovereign holds his office by heredity. It is divided into four circles (Kreise) for governmental purposes, which include the provinces of Neckar, Jaxt, Black Forest, and Danube. The kingdom has four votes in the federal council of the German Empire and seventeen representatives in the national diet. Efficient elementary and secondary school systems are supported by the government and school attendance is compulsory. A recent official census shows that not an individual in the kingdom, above the age of ten years, is unable to read and write. The government maintains a fine system of benevolent and reformatory institutions, industrial schools, and institutions of higher education. University of Tübingen, founded in 1477, is one of the famed institutions of Europe, and the Polytechnic School at Stuttgart is noted for its educational influence on public thought. though no established religion is secognized by the government, the inhabitants are almost exclusively Protestant and the king is vested with the supreme direction of the Protestant Church.

The earliest inhabitants of Württemberg probably were Celtic, but the Suevi occupied the country at the time of the Roman conquest, and in the period of the decline of Rome it was overrun by the Alemanni and the Franks. Conrad, Count of Württemberg, possessed a small territory in 1090, but his successors added considerably to the possessions, especially Ulrich I., who governed the country from 1246 to 1265. It was erected into a dukedom in 1495 by Emperor Maximilian, who conferred upon the reigning

duke the title of Eberhard I. In 1805 it became a kingdom, in consequence of Duke Frederick II. having aided Napoleon. His son, William I. (1781-1864), reigned for a period of fifty years, giving the people a liberal and progressive government. The kingdom joined the German Empire in 1871 and has since been an influential factor in the Federal government. Stuttgart is the capital and largest city. Population, 1905,

2,302,179; in 1910, 2,435,611.

WU TING FANG (woo ting fang'), diplomat and statesman, born at Singapore, in the Straits Settlements, in 1842. He was enrolled at Saint Pauls College, Hong Kong, in 1855, where he studied five years, and subsequently became interpreter in the British law courts. Afterward he studied law at Lincoln's Inn, London, and was admitted to the bar and practiced his profession at Hong Kong. The government of China placed him on the official staff of Li Hung Chang in 1882, and he served on the commission that negotiated the Treaty of Shimonoseka. In 1896 he was made minister to the United States and became prominent as an opponent of the Chinese exclusion act. The Chinese government recalled him in 1902 and made him commissioner to aid in negotiating treaties with foreign countries. He was made vice president of the board of commerce in 1903, and as such officer exercised a wide influence in opposition to the Chinese boycott of American products in 1905. The following year he began to advocate the adoption of the jury system in China.

WURZBURG (vürts'boorg), a city of Germany, in the northwestern part of Bavaria, sixty miles southeast of Frankfort-on-the-Main. It is finely situated on the Main River, which is crossed by a number of substantial bridges, and has extensive railroad facilities. The principal buildings include the Julius Hospital, the Neumünster Kirche, the Episcopal Palace, and the famous University of Würzburg. This university was founded in 1582 and has 1,500 students and a library of 352,000 volumes. The city has a number of other institutions of learning, including a gymnasium, a seminary, and a college of agriculture and mechanic arts. Marien Kappelle, a church of great beauty, is adorned with fourteen statues of famous men. Würzburg has a number of beautiful monuments and statues, including one erected to the memory of Walther von der Vogelweide. The streets of the city are paved with stone and asphalt. It has systems of gas and electric lighting, sanitary sewerage, waterworks, and electric street railways. Among the manufactures are cotton and woolen textiles, leather, glassware, railroad cars, machinery, and farming implements. A battle occurred between the Prussians and Austrians near Würzburg in 1866. About 7,000 French prisoners were confined in its prison and barracks at the time of the Franco-German War. Population, 1905, 80,-327; in 1910, 84,387.

WYANDOTS (wi-an-dots'), a North Ameri-

can Indian tribe of the Iroquois family. They first came in contact with the whites in the vicinity of Lake Huron, where they engaged in the culture of tobacco, from which circumstance they were called the Tobacco Indians for some years. The Iroquois nearly exterminated them in 1636 and the surviving remnant settled in the vicinity of Detroit, Mich. In 1812 400 Wyandots sided with the English. Subsequently they sold their lands to the United States, some of them removing to Canada and others to Kansas. At present they number about 800, of which about 100 are in Ontario, 350 are in Oklahoma, and 400 are in Quebec.

WYANDOTTE (wi'an-dŏt), a city of Michigan, in Wayne County, twelve miles southwest of Detroit. It is situated on the Detroit River and on the Michigan Central, the Grand Trunk, the Lake Shore and Michigan Southern, and other railroads. The chief buildings include the public library, the high school, and a number of fine churches. It has manufactures of malt liquors, furniture, gasoline engines, salt, chemicals, clothing, and farming machinery. The public utilities include electric lighting, sanitary sewerage, and waterworks. Wyandotte was platted in 1854 and incorporated in 1867. Population,

1904, 5,425; in 1910, 8,287.

WYANDOTTE CAVE, an important subterranean passage four miles north of Leavenworth, Ind. It rivals the Mammoth Cave of Kentucky and has been explored about 22 miles. The two largest rooms range in height from 150 to 245 feet and have beautifully formed chambers of stalactites and stalagmites. The different places of interest include those known as the White Cloud Room, the Mammoth Hall, the Pillared Palace, and the Beauty's Bower. In some places the walls are covered with crystals of Epsom salt. Beautiful white gypsum rosettes are in the cave.

WYANT (wi'ant), Alexander H., landscape artist, born in Port Washington, Ohio, Jan. 11, 1836; died in New York City, Nov. 29, 1892. After studying in his native country, he received instruction under Hans Gude at Carlsruhe, Germany. Subsequently he visited many countries of Europe and on returning to the United States was made an Academician, in 1869. He devoted much time to painting autumn effects in American forests, particularly along the Ohio River and in the Adirondacks. His best works include "Wilds of the Adirondacks," "Late Autumn," "View on Lake George," "Sunset on the Prairie," "Scene on the Upper Susquehanna," and "Scene on the Upper Little Miami."

WYATT (wi'út), Richard James, sculptor, born in London, England, May 3, 1795; died in Rome, Italy, May 29, 1850. He descended from a family which is noted because it includes a number of architects and sculptors. After studying in his native city, he pursued a course in Paris and afterward studied art in the studio of Canova at Rome. Many of his works take high

rank for their delicacy and finish and several of them won a number of medals. His best known sculptures include "Ino and Bacchus," "Penelope," and "Eucharis and Cupid."

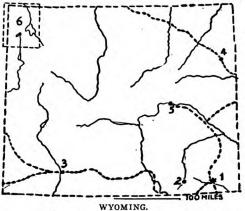
WYATT, Sir Thomas, poet, born in Kent, England, in 1503; died Oct. 11, 1542. Although his poetry does not take high rank in intrinsic value, yet he is an important figure in the early history of English literature. After studying at Cambridge, he became attached to the court of Henry VIII. and was present at his wedding with Anne Boleyn. He was knighted in 1536 and was twice sent as ambassador to the court of Charles V., in which capacity he acquitted himself with much diplomatic skill. On returning to England he lived in comparative retirement at Allington, where he devoted himself to writing poems and satires. His songs and sonnets are among the best early literary productions in England and may be said to rank with those of Surrey.

WYCLIFFE (wik'lif), or Wyclif, John, noted reformer, born in Yorkshire, England, about 1324; died Dec. 13, 1384. He descended from a noble family, was educated at Oxford University, and was appointed master of Baliol Hall, now called Baliol College. Subsequently he was made rector of Lutterworth, in Leicestershire, and soon became noted as an opponent of the monks, against whom he directed various religious writings. At that time disputes took place between Edward III. and the papal court in regard to certain tribute money, which the king had refused to pay, and Wycliffe came forward with a number of tracts in support of the king. He labored zealously in the rectory of Lutterworth until his death, but several times was sorely tried by those opposed to his progressive views of reform. In 1378 he was summoned before a convocation at Saint Paul's Church by Courtenay, Bishop of London, but his friends came to his assistance by breaking up the meeting in confusion.

Three bulls were issued by the Pope to the king, the primate, and the University of Oxford, in which each was commanded to proceed against Wycliffe, but nothing further came from the proceedings than that he was enjoined from preaching obnoxious doctrines against the Pope. He was engaged for some time in translating the Bible from the Latin Vulgate and in 1381 publicly challenged several doctrines of the Catholic Church. Archbishop Courtenay called a provincial council, which declared Wycliffe a heretic, and some of his works were burned. A number of his followers were imprisoned for making gross charges against the authorities, but he was allowed to return to Lutterworth. The Council of Constance condemned his doctrines about thirty years after his death, but they left a marked influence upon public thought. Wycliffe wrote a large number of works in Latin and English and many tracts. His followers were called Lollards, from the fact that they displayed

much eagerness in their efforts to spread his doctrines.

WYOMING (wi-o'ming), a western State of the United States, popularly called the *Equality* State, owing to its having been the first to ex-



1, Cheyenne; 2, Laramie; 3, Rock Springs; 4, New Castle; 5, Casper; 6, Yellowstone National Park. Principal rail-roads shown by dotted lines.

tend the right of suffrage to women. It is bounded on the north by Montana, east by South Dakota and Nebraska, south by Colorado and Utah, and west by Utah, Idaho, and Montana. The length from east to west is 356 miles and the width from north to south is 275 miles. It has an area of 97,575 square miles.

DESCRIPTION. The State is crossed from southeast to northwest by the Rocky Mountains, which form the Continental Divide and are the source of a number of important rivers. Wyoming is a lofty plateau with an average altitude of about 6,000 feet, but many of the mountains tower far above the snow line. The principal mountain chains include the Shoshone, the Teton, the Wind River, the Big Horn, the Sweetwater, and the Laramie ranges. On the eastern boundary, between Wyoming and South Dakota, is the group known as the Black Hills. Among the chief peaks are Laramie, height 10,975 feet, and Fremont, 13,570 feet. In the northwestern part is the famous Yellowstone National Park, which has an area of 3,575 square miles and is remarkable for its natural scenery and numerous geysers. This region is a rugged complex of lofty mountains and extensive cañons, but is beautified by fine lakes and streams.

The drainage belongs to two systems, the headstreams being separated by the Rocky Mountains. The streams on the eastern slope belong to the Missouri system and those on the western slope are classed with the systems of the Colorado and the Columbia rivers. Yellowstone and Jackson lakes are the only large sheets of water. Jackson Lake is the source of the Snake River, which is a tributary of the Columbia, and Yellowstone Lake is the source of the Yellowstone, a confluent of the Missouri. Other streams belonging to the Missouri system include the Big Horn,

3192

the Powder, the Chevenne, the Belle Fourche, the Wind, the North Platte, and the Laramie rivers, while the Greene River belongs to the Colorado basin. None of the rivers is navigable, but many are important for irrigation and the

water power that they furnish.

The climate, like that of other Rocky Mountain states, is arid and healthful. At Sheridan the mean temperature for January is 18° and at Cheyenne it is 25°, while the mean in July of both localities is 67°. The maximum temperature is somewhat above the 100° and the minimum falls as low as 40° below zero. Rainfall for the State is given as 13 inches, but it ranges from 16 inches in the eastern to 8 inches in the western parts. The largest falls of rain occur from March to June and the remainder of the summer season is extremely dry.

MINING. Wyoming is rich in many of the useful minerals. It has an abundance of coal and there has been a steady increase in the output of this product. The normal average is placed at 6,800,000 short tons per year. Petroleum is found in many parts of the State, especially in Fremont and Natrona counties, and the annual production is placed at 10,500 barrels. Iron deposits occur in many localities and granite and limestone are abundant, but these minerals have not been developed extensively. Gold and silver are mined profitably and mineral waters and natural gas are found in abundance. Other minerals include copper, zinc, salt, soda, asbestos, gypsum, sulphur, bismuth, clays, and graphite. The deposits of minerals are not worked as extensively as conditions would justify, owing largely to the lack of adequate transportation facilities.

AGRICULTURE. It is estimated that about onesixth of the State is capable of cultivation, though irrigation must be resorted to for the production of most crops. The lands lying between the mountains and the valleys of the rivers are generally fertile and a large supply of water is available for irrigation. A large proportion of the inhabitants reside in the valley of the North Platte River, which supplies a large part of the water. Extensive forests of cedar, pine, spruce, aspen, and cottonwood abound in the mountains and along the streams, but the broad plateaus are without timber and can be easily cultivated. Hay and forage crops are grown most extensively. Oats and wheat are the leading cereals. Other products include corn, barley, rye, potatoes, and the hardier fruits.

The native grasses cure naturally in the dry climate, hence are of much value for grazing, especially in that they furnish food for stock throughout the winter. Sheep are raised very extensively, the number being 6,525,000 head. Cattle are grown chiefly for meat, but rapid developments are taking place in dairying. Other domestic animals include horses, swine, mules, and poultry. Cattle, horses, and sheep are raised extensively on large ranches.

MANUFACTURES. A lack of facilities to transport iron, timber, petroleum, and other products to the towns has retarded manufacturing to a considerable extent. A large proportion of this enterprise is confined to railway repair shops. The leading products include lumber, flour and grist, brick and pottery, soda and chemicals, clothing, and machinery. There has been a material increase in the output of butter and cheese, tobacco products, and farming implements the past decade.

TRANSPORTATION. None of the rivers within the State is navigable and many sections are not provided with railway facilities. The railway lines have a total of 2,150 miles in operation and they are confined principally to the south-ern and eastern parts of the State. The transcontinental line of the Union Pacific crosses the southern part of the State from east to west, the Chicago, Burlington and Quincy crosses the northeastern corner, and a line of the Chicago and Northwestern penetrates the east central part. Other railways have branches in the southeastern section and the Yellowstone National Park is reached by a branch of the Northern Pacific, though it does not enter the State. Few of the highways have been improved, but trails for interior travel have been located, which are used chiefly for transportation by mules and

GOVERNMENT. The constitution was adopted at the time Wyoming became a State, in 1890. It grants equal political rights to both sexes and is the first document of this kind to extend the right of suffrage to women. The executive authority is vested in the governor, secretary of State, treasurer, auditor, and superintendent of public instruction, each elected for four years. The Legislature consists of a senate of 23 members and a house of representatives of 50 members. Sessions of the Legislature are held biennially. A chief justice and two associates constitute the supreme court. Other courts may be established by the Legislature, including circuit, probate, and justices' courts. Local government is vested in the towns, municipalities, and

EDUCATION. The State has occupied an enviable position from the standpoint of education since its admittance to the Union, having had a very small per cent. of illiteracy during the entire period. However many sections within the State are so sparsely settled that it is difficult to provide educational facilities in some localities. All parts which are settled have public schools. A compulsory attendance law has been inforced since 1907. The schools are maintained largely by the rental of public lands which have been set aside for school purposes, but additional support is given through a system of general and local taxation. Text-books are supplied free by the State, under a graded and uniform course of in-

The University of Wyoming, located at Lara-

mie, is at the head of the public school system. Cody City is the seat of the Cody Military College, Evanston has the insane asylum, and Cheyenne is the seat of the soldiers' home. Rock Springs has a State hospital and Rawlins has the penitentiary. All the schools and the State institutions are managed efficiently.

INHABITANTS. The State has a foreign-born population of 17,415, consisting chiefly of Germans, Scandinavians, and British. Among the leading religious denominations are the Mormons, Catholics, and Methodists. Cheyenne, on the Crow River, is the capital and largest city. Other cities include Laramie, Rock Springs, Rawlins, Sheridan, Evanston, and Green River. In 1900 the State had a population of 92,531. This included 3,480 colored people, of whom 393 were Japanese, 461 Chinese, 940 Negroes, and 1,686

Indians. Population, 1910, 145,965.

HISTORY. The region now included in Wyoming was acquired by the United States partly through the Louisiana Purchase of 1803 and partly by the Mexican cession of 1848. In 1834 the first white settlement was made on the present site of Fort Laramie. At that time the overland route to California extended through the country now included in the southern part of the State, particularly along the North Platte River, and many emigrants from the states further east sought their fortune on the Pacific coast by passing through the region. Mormons settled in the Green River valley in 1853 and about the same time several mining camps became developed. Wars with the Indians were extended and numerous, the chief tribes including the Sioux, Utes, Crows, Arapahoes, and Shoshones. General Crook reduced most of the tribes to submission in the period extending from 1876 to 1877, and soon after the Indians were either transported or placed on reservations. Wyoming was organized as a Territory in 1868 from lands which at one time were included in South Dakota, Idaho, and Utah. It was admitted as a State in 1890.

WYOMING, University of, a coeducational institution of higher learning at Laramie, Wyo., founded from the proceeds of public land grants in 1887. This institution includes all the departments of higher learning within the State. It is composed of the College of Liberal Arts, the Graduate School, the School of Mines, the College of Agriculture, the College of Mechanical Engineering, the School of Music, the School of Commerce, and the Normal School. Since many sections of the State are not supplied with high schools, the institution maintains a preparatory school with a two years' course. No tuition is charged in any department of these schools. Since Laramie has an ideal climate and Wyoming presents a great field for research work, many learned men and women are attracted to this institution as lecturers and instructors It has a library of 40,000 volumes, an income of \$90,000, and property valued at \$450,000. The attendance is about 600 students.

WYOMING VALLEY, a fertile and beautiful valley of the north branch of the Susquehanna River, in Pennsylvania. It is inclosed by mountains. The chief city in the region is Wilkesbarre, county seat of Luzerne County. Wyoming Valley is noted for its history as well as fertility. The Wyoming massacre occurred at the town of Wyoming on July 3, 1778, when 800 Tories and a large number of Indians made an attack on the inhabitants. Most of the men were absent on service in the Continental army and the town was obliged to surrender on July 5, when all those unable to flee were massacred by the Indians, who took 227 scalps and spared only the women and young children. The settlers were largely from Connecticut and their descendants made claim to the titles of the lands, which were afterward also claimed by citizens of Pennsylvania. This gave rise to the so-called Pennymite wars. Connecticut claimed the region until 1782, when Congress decided the contest in favor of Pennsylvania, and the State Legislature in 1788 confirmed the titles to those holding property. A fine monument was erected, in 1843, on the scene of the Wyoming massacre.

WYSS (vis), Johann Rudolf, author, born in Berne, Switzerland, March 13, 1781; died there March 30, 1830. He acquired a liberal education and in 1806 became professor of philosophy at Berne. Later he was made chief librarian in the university and became the author of many excellent works. His best known production is "The Swiss Family Robinson," which was translated from the German into French, English, and other languages and is still read extensively in many tongues. Other writings include "Readings in Relation to the Highest Good," "A Tour in Upper Berne," and "Swiss Folklore and Legends,"

WYTHE (with), George, signer of the Declaration of Independence, born in Elizabeth City, Va., in 1726; died June 8, 1806. He inherited a large fortune from his parents, but spent much of it in dissipation. Later he studied law and, after being admitted to the bar, in 1757, became eminent as a lawyer. He had a seat in the Continental Congress from 1775 to 1777 and there demonstrated much ability in advocating the absolute independence of the colonies. He was professor of law at William and Mary College from 1779 to 1789 and was chosen, in 1786, to aid in framing the Constitution of the United States. Though a large slaveholder, he emancipated those under his control and gave them means to support themselves until they became able to earn a living,



X

XENIA

X, the twenty-fourth letter and nineteenth consonant of the English alphabet. It is often spoken of as a superfluous letter, because it represents no sound that may not be represented by other letters. Usually it has the sound of ks when occurring in the middle of a word, as in taxes, axis, foxes. At the beginning of a word it has the sound of z. In some words it has the sound of ks as a terminate letter, as in lax, wax, tax. In Roman writing x was the last letter in the alphabet. It signifies ten as a Roman numeral; when placed horizontally (x) it represents a thousand, and with a dash over it (\bar{X}) the symbol indicates ten thousand. In algebra x is the usual symbol for the unknown quantity which is to be determined.

XANTHIPPE (zăn-tīp'pe), the wife of Socrates, who is represented by most writers as a scolding dame. It is probable that the small concern shown by Socrates in affairs of household economy caused his wife to be frequently at wit's end to know how to make housekeeping possible; thus she developed an aptitude for calling attention to household necessities at times when Socrates returned from long conversational interviews with fellow philosophers and students. Plato describes her as a really kind woman, and one much concerned in the welfare of the household. However, the name has become proverbial and is associated with one who scolds by force of habit.

XANTHUS (zăn'thus), an ancient city in the southwestern part of Asia Minor, capital of Lycia, on the Xanthus River, near the present village of Gunik. The city seems to have been founded at a very early date, and its inhabitants were governed by independent princes. Lycia was invaded by the Persians and the capital was twice destroyed, the last time in 546 B. c., and Alexander captured it at the time of his campaign in the East. Brutus with a Roman army took possession of the city in 43 B. C., when only a few of the inhabitants survived. Many ruins of ancient structures have been uncovered, showing that the place was well built and contained many tombs and sculptures. The most noted buildings belonged to the 6th century B. C. and were evidently of Greek origin. They included many theaters, the statues of the Nereids, and

a sculpture known as the Harpy Tomb, now in the British Museum. Among the remains still intact are the walls of the Acropolis, a Roman gate, and several tombs and temples.

XAVIER (zăv'i-er), Saint Francisco, saint and missionary of the Roman Catholic Church, born in Navarre, France, April 7, 1506; died near Macao, China, Dec. 2, 1552. His father was councilor of state to the King of Navarre and sent him to the University of Paris in 1524, where he made remarkable progress in his studies. In 1528 he became lecturer in philosophy, and soon after was granted a degree of master of arts. He joined the society formed by Ignatius Loyola with the view of doing missionary work in Palestine, and afterward joined others as a member of the Society of Jesus. Loyola selected him to labor in the mission field of the Portuguese possessions in the East Indies. He sailed with an associate from Lisbon on April 7, 1541, and reached Mozambique after a voyage of five months. After wintering in the southern part of Africa, he sailed for Ceylon and the Moluccas, and finally visited Japan. Xavier labored for ten years as a missionary in the East, and died at the time when he intended to begin missionary enterprises in China. The work of Xavier stands preëminent among the achievements of noted missionaries. He visited 52 countries to spread the gospel, and witnessed the baptizing of many thousands. Xavier is usually spoken of as the Apostle of the East Indies. Pope Gregory XV. canonized him in 1622, and Benedict XIV. proclaimed him protector of India. He was buried at Goa, then the capital of the Portuguese Indies. His writings consist largely of epistolary letters and a catechism.

XEBEC (zē'běk), a small vessel which has three masts with both square and lateen sails, being variously arranged. It differs from the felucca, a coasting vessel employed on the Mediterranean, in that the latter has only lateen sails. The Algerian pirates used xebecs which carried from twelve to twenty guns. Most of these vessels had low sides and the deck was somewhat convex, permitting the water to flow off through the scuppers.

XENIA (zē'nĭ-à), a city in Ohio, county seat of Green County, fifty miles southwest of Co-

lumbus, on the Pennsylvania, the Cincinnati, Hamilton and Dayton, and other railroads. It is surrounded by a fertile farming region and has communication by several electric railroads. The chief buildings include the county courthouse, the public library, the city hall, the Ohio Soldiers' and Sailors' Orphans' Home, the United Presbyterian Theological Seminary, a business college, and a number of parochial schools. Near the city, at Wilberforce, is the Wilberforce University, which was opened in 1856 for colored students. Among the manufactures are paper, powder, tinware, cordage, glass, shoes, carriages, earthenware, and machinery. The city has pavements, gas and electric lighting, municipal waterworks, sewer drainage, and other improvements. Settlements were made in the vicinity as early as 1804. It was incorporated in 1808. Population, 1900, 8,696; in 1910, 8,706.

XENOPHON (zen'o-fun), eminent general and author, born in Athens, Greece, about 445 B. C.; died in 357 B. C. He descended from par-



XENOPHON.

ents who were in good standing and became a pupil of Socrates, under whom he studied philosophy. In 401 B. c. he joined the expedition of the younger Cyrus against Artaxerxes, King of Persia. It was rather his aim to visit Western Asia than to enter into the conflict of battle

that he joined the army, but the Greek generals were treacherously murdered at the engagement of Cunaxa, thus devolving a large share of the responsibility connected with the generalship upon Xenophon. He was the leading spirit in the famous retreat of the 10,000 Greeks to Trebizond, on the Black Sea, and after returning to Greece joined the military service of the King of Sparta, which was then the leading state of the Greek world. Later he settled in Elis, where he devoted twenty years to literary work and agriculture. His writings include a number of excellent historical works, essays, and treatises. The "Anabasis" is his chief writing, in which he relates the history in connection with the expedition into Persia. This work is divided into three parts. The first relates to the invasion of Persia by Cyrus against his brother, Artaxerxes, and includes a description of the Battle of Cunaxa; the second recounts the retreat of the 10,000; and the third part describes the adventures of the Grecian army after reaching Trebizond. This work of Xenophon was written in a pure Attic Greek style. It exhibits the power of the author as an observer and portrays him as a strong and tireless worker. Other writings include the "Memorabilia," a record of the life and teachings of Socrates; the "Cyropaedia," a biography of Cyrus of Persia; the "Hellenica," a history of Greece covering 48 years; and the "Spartan and Athenian States," a work devoted to politics and economics. These and others of his writings have come down to us. Many translations from his works have been made by divers writers.

XERXES I. (zěrks'ēz), King of Persia, eldest son of Darius. His birth and early history are unknown, but it is reasonably certain that he reigned from 485 to 465 B. c. He is mentioned as Ahasuerus in the Book of Esther, and is famous in history in connection with several noted Grecian campaigns. His father died in 485 B. C., while making preparations to invade Greece for the third time, and Xerxes immediately began to make elaborate plans for carrying his father's designs into execution. The preparations were remarkable in that provisions were collected to support a vast army for three years, a great transport fleet was constructed. and the most skilled engineers obtainable were engaged to plan the removal of natural obstructions. Historians agree that the army and navy represented a combined force of 2,000,000 men, and to secure the passage across the Hellespont a bridge of boats a mile long was constructed. Herodotus speaks of the army as numbering two and a half million combatants, though it is possible that this is an exaggeration, and states that it required seven days and nights for the forces to cross over the Hellespont.

Xerxes, having landed on European soil, marched unobstructed until he reached Thermopylae, where he was brought to a stand by Leonidas, who was at the head of a small though determined band of Spartans. The latter guarded the narrow passage with remarkable persistence until he was defeated through treachery, but when Xerxes reached Athens he found the city deserted. Though successful on land, Xerxes found his fleet driven to desperation and finally it was defeated. The Grecians attained success in two engagements at Artemisium and a storm did much damage to the Persian fleet, destroying 400 ships of war. In 480 B. c. the final naval battle was fought at Salamis, where the Persians were defeated with great loss, and Xerxes fled to the Hellespont. A storm had destroyed the bridge of boats in the meantime, hence he crossed over in a vessel and left Mardonius with a Persian army of 300,000 men to subdue Greece. That general was defeated by the Grecians the following year in the Battle of Plataea, and in 478 B. c. the last possession of the Persians in Europe was taken from them by the victorious Grecians. Xerxes spent his later years in obscurity and was finally murdered by the commander of his bodyguard, Artabanus, who attempted to usurp the Persian throne. However, Artaxerxes, his son, ascended the throne in 465 B. C. Herodotus represents Xerxes as cruel and

cowardly, but credits him with highly attractive personal qualities, and asserts that he was skillful in furthering the interests of his government.

XIMENES (zī-mē'nēz), Francisco, statesman and cardinal, born at Torrelaguna, Spain, in 1436; died at Branquillas, Nov. 8, 1517. He was born of humble parents, but obtained a liberal education at Salamanca and Rome, and while in the latter city was nominated prebend in the Cathedral of Toledo. The archbishop opposed his appointment and caused him to be imprisoned, but released him on surrendering his preferment. In 1482 he entered the Franciscan order of monks. His piety and learning caused Isabella to select him as confessor in 1492, and three years afterward she named him Archbishop of Toledo. The high degree of confidence placed in Ximenes by Isabella gave him a wide influence in the public affairs of Spain, and on her death, in 1504, he was likewise favored by Philip. The latter named him regent and guardian of Queen Joanna, who was simple-minded, on his death in 1506, and during his incumbency he extended the power of the crown by reducing that of the nobles. In 1507 he was raised to the dignity of cardinal, and at the death of Ferdinand, in 1516, he was made regent of Castile until the arrival of King Charles I., afterward Charles V. of Germany. No Spanish statesman of his period stands higher in repute as an administrator. He founded many schools, churches, and hospitals.

XIMENES DE QUESADA, Gonzalo, explorer, born in Granada, Spain, in 1495; died at Santa Agueda, South America, Feb. 16, 1579. He

came to America on an exploring expedition in 1539, and had charge of the military forces of New Granada, now called Colombia, against the Chibcha Indians. Soon after reaching America he marched southward to conquer the interior regions, and in 1538 founded the city of Bogotá. Benalcázar and Frederman, two other explorers, sailed with him to Europe to submit their dis-

putes to the king for arbitration. After hearing the cause of their disagreement, the king ordered Ximenes fined and suspended, but he was afterward sent as marshal to Granada, and in 1561 became governor of that region. As chief executive of the northwestern part of South America he served Spain with loyalty until his death. He wrote an account of his adventures, but his works are lost. In 1597 his remains were removed to Bogotá.

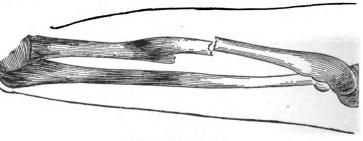
moved to Bogotá.

XINGÜ (shên-gōō'), an important river of Brazil, which rises on the plateau of Matto Grosso and, after a northerly course of 1,150 miles, flows into the Amazon, near the head of

the estuary. Several impassable falls and rapids obstruct the stream in the course about 150 miles from its mouth, in a part of the river known as the Great Bend. It is navigable for steamers for 110 miles. In 1885 the river was explored with much care under the direction of the Brazilian government.

XOLOTL (zō-lōtl'), surnamed The Great, founder of the Mexican dynasty of Tenayucan, or Texcoco, flourished in the 12th century. After the downfall of the Toltec monarchy, he was the chief of the Chichimeca tribes and proclaimed himself king of the country tributary to Lake Texcoco about 1160. His ambition was to found a powerful monarchy. To accomplish that end he united with his kingdom the Toltecs, Aculhuas, and Tecpanecs and encouraged industrial and educational arts. He caused the Nahuatl dialect, a branch of the Toltec language, to be made the official tongue, which soon superseded all others and came to be called the Aztec. The city of Texcoco was made the center of Anahuacan civilization. It was beautified by fine squares and gardens, and in it he erected a palace and a temple dedicated to the sun. Two of his daughters married chiefs of the Aculhuas, who became the founders of the empire of Atzcapotzalco.

X-RAYS, or Röentgen Rays, the peculiar rays of light which are produced by sending electric discharges through exhausted glass tubes. They were discovered by Professor Röentgen in 1895 and were named X-Rays, meaning unknown rays. X-Rays are peculiar for their power of penetrating opaque objects, an example of which is shown in the accompanying illustra-



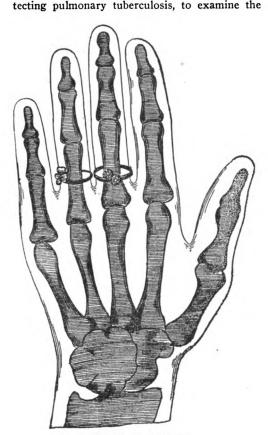
EFFECT OF X-RAYS.

Showing Broken Bone in Arm.

tion. All bodies seem to be transparent when subjected to these rays, but in different degrees. It will be seen that the flesh of the hand appears as a mere outline, while the rings on the fingers give a darker effect than the bones. The rays pass freely through blocks of wood, flesh, thick books, and plates of ebonite. Metals are among the most highly opaque substances, and bone is more opaque than flesh.

By means of these rays it is possible to make a photograph of the bones of the living hand, or of the organs in any part of the body, as the lungs, heart, muscles, and kidneys. It is possible to so apply these rays that a surgeon may 3197

locate and examine minutely the fracture of a bone, a bullet, or a tumor in any part of the body. These rays are very serviceable in de-



EFFECT OF X-RAYS. Showing Bones of Hand.

size and position of the heart, and in fact to observe the form and condition of practically all organs of the living body. It has been computed that one person in every 800 is blind to the X-Rays, that is, when looking through the fluoroscope is unable to see the objects clearly seen by the ordinary observer. The nature of the X-Rays and their origin are still in doubt, and, like electricity, they may be studied only by their manifestations. See Cathode Ray; Crookes Tubes.

XYLENE (zī'lēn), the name applied to three isomeric hydrocarbons, which were first obtained in a pure state from coal naphtha in 1863. Subsequently a process was discovered by which xylene is obtained successfully from wood spirit. The product is a volatile, inflammable liquid. It is colorless, boils at 282°, and has a peculiar odor. Several derivatives are obtained from it,

including methyle-xylene, ethyle-xylene, and the nitro-xylenes.

XYLOPHONE (zī'lō-fōn), a musical instrument which consists of a series of bars of wood or glass, arranged horizontally upon two longitudinal cords or sills. The bars are graduated in length to the musical scale, and the instrument is played by striking them with two small hammers held in the hands. This instrument has a compass of about two octaves. It is of ancient origin and is now used extensively among the Poles and Russians. Recently it has become popular in connection with the phonograph, its tones being suitable for clear reproduction by the latter instrument.

X Y Z CORRESPONDENCE, the name applied to certain dispatches between the United States and France, at the time John Adams was President. The United States had received valuable aid from France at the time of the Revolution, which was in accord with treaties made in 1778, and the latter country desired an alliance with the United States in the war against England and other countries, following the overthrow of the monarchy in 1789. An effort to make such an alliance not only failed, but President Washington persisted in preserving neutrality and the government contracted the Jay Treaty with England, whereby the directory, which then governed France, became offended. It promptly issued letters empowering French vessels to assail American ships, but the President convened Congress in extra session and named John Marshall, Charles C. Pinckney, and Elbridge Gerry as commissioners to treat with France. In the meantime John Adams had succeeded to the Presidency.

Talleyrand, who was then minister of foreign affairs, did not manifest a desire to hold an interview with the Americans, but instead sent Hauteval, Hottinger, and Bellamy as special agents to confer with the commissioners. In the dispatches these agents were designated as X, Y, and Z, hence the whole matter became known as the X Y Z correspondence, or mission. The French agents in the course of the conference requested a monetary consideration or a loan in order to conclude the matter, but the Americans refused to grant such a demand. It was in this connection that Pinckney is quoted as saying, "Millions for defense, but not a cent for tribute." Shortly after the dispatches were submitted to Congress France ordered Pinckney and Marshall to leave the country and the United States government recalled Gerry. War with France was threatened on account of these matters and a few naval engagements occurred, but Napoleon became first consul of France and was favorably inclined toward the United States. Both countries ratified a treaty in 1800, which was declared in force on Dec. 21, 1801.



Y

YACHTING

Y, the twenty-fifth letter of the English alphabet. It is used both as a consonant and a vowel. The letter y was adopted into the Latin from the Greek letter upsilon, and afterward became incorporated into the alphabet of the Anglo-Saxons. As a vowel it is now employed regularly for final i, as in city, pity, and multiply. At the beginning of syllables it is usually a consonant, but is a vowel in that case when it is followed by a consonant, as in Ypsilanti. It is always a consonant when followed by a vowel. In the Spanish it is used instead of the personal pronoun I, and in Latin it is employed only as a small letter. It has no place in the German writings aside from its use in words of foreign origin. Y, as a symbol in algebra, stands for the second variable or unknown quantity.

Y, or Ij, the portion of the Zuyder Zee which extends north of Amsterdam, in the province of North Holland. Formerly it was 21 miles in length and had a width of several miles, but it has been almost entirely reclaimed for cultivation, except the central part, which has been deepened as a portion of the North Sea Canal. This canal is connected with the Zuyder Zee

through a lock.

YABLONOI (yà-blà-noi'), the name of a range of mountains in Eastern Siberia, in the region east of Lake Baikal. It has a general direction toward the north and northeast, extending a distance of 1,000 miles, and merges into the Stanovoi Mountains. The highest altitudes are in the southwest, where they rise about 8,500 feet above the sea. Their slopes are covered with forests, but the summits are bleak and cold.

YACHT (yŏt), a sailing vessel which is specially built with the view of obtaining speed. Such a vessel is usually designed for pleasure, as for racing or for traveling. Many varieties of yachts are in successful use, ranging from those comparatively small and best adapted for pleasure trips to the seagoing vessels designed for pleasure and racing. In the latter two classes they are supplied with luxurious furnishings. The rigs are various, and many pleasure yachts now have steam power as an accessory or for use during calms. The hull of racing yachts is ballasted quite heavily and they are rigged with large sails, thus supplying the necessaries for

considerable speed. Among the chief rigs for yachts are those known as the yawl, cutter, and schooner. The yawl has a running bowsprit, one mast, and a small mizzenmast, while the cutter is without the last mentioned. schooner has two masts-a foremast and a mainmast-and either a standing or a running bowsprit. Besides these three classes there are a number of others, and those of each class differ widely as to the sails and lines and the quantity

of steam power supplied.

YACHTING, the art of racing and traveling for pleasure by means of a yacht. Yachting has long ranked as an agreeable sport, in racing with yachts and boats with sails, either for pleasure, for money, or for a cup. Competition has caused many improvements to be made in yacht building, just as horse racing has improved horses, and there is an authentic record of yachting clubs for about two centuries. The first sailing club on record, known as the Cork Harbor Water Club and now called the Royal Cork Yacht Club, dates from 1720 and is still the most efficient in Ireland. In the early history of yachting the boats were small, but they gradually increased in size, while other improvements were added to give them both speed and security. The first yacht club in America was founded at New York by nine yacht owners in 1844. At first the main object was to bring the American record up by making improvements in sailing vessels, but later attention turned to competition with foreign yachting clubs.

The schooner America crossed the Atlantic in 1851 and won the Queen's cup by defeating the Aurora. Several efforts have been made to recover the lost cup, but the United States has held it ever since. The memorable contests embrace that of the Cambria against the American schooner Puritan in 1870; that of the Galatea against the Mayflower in 1886; that of the Thistle against the Volunteer in 1887; and those of the Shamrock against the Columbia in 1901 and since. The Shamrock was owned by Sir Thomas Lipton, of the Royal Ulster Yacht Club, and the Columbia by J. Pierpont Morgan, commodore of the New York Yacht Club. In these contests, which are among the most notable on record, the Columbia demonstrated in succes3199

sive competitive races that the American vessel was superior in every respect for security and speed. At present about 200 famous yachts are maintained in the United States, including, besides those named, the Defender, Genesee, Vigilant, Gloriana, Katrina, Rainbow, Ramona, Colonia, Virginia, Coronet, Sachem, Minnesota, and Amorita. The races in America are usually sailed off Sandy Hook.

Since 1903 the launches propelled by motors using products of petroleum in place of steam have grown in popularity. The first naphtha launches were set afloat in 1886. To this class belongs the Adios, built in 1902 by H. S. Leigh-This launch has a motor of 120 horse power, is 55 feet long, and attained a speed of 23 miles an hour. In some yachts alcohol is used in place of naphtha and electric storage batteries are employed to some extent, especially where the trips are not far from shore, though in some vessels the power is generated by dynamos on board.

The most eventful yacht racing in 1905 occurred in May, when the international transatlantic race from Sandy Hook to the Lizard, England, took place. Emperor William of Germany had offered as a prize the Kaiser's Cup, valued at \$5,000, and it was won by the American yacht Atlantic, making the trip in twelve days, four hours, and three minutes, the best record for cross-ocean passage of yachts. In September the racing for the Astor Cups took place off Newport, the Yankee winning the sloop cup and the Elmina winning the schooner cup. Edward VII. offered the King's Cup as a challenge for American yachts. The first race occurred off Newport in August, 1906. Other famous races have been stimulated by the Canada Cup, the Lipton Cup, etc.

YAK (yăk), a bovine ruminant native to Central Asia. It is found chiefly in Tibet, and



DOMESTICATED YAK AND CALF.

is regarded intermediate between the bisons and the true oxen. The yak is still abundant in the wild state in the lofty plateau between the Altai Mountains and the Himalayas, where it subsists on the coarse, wiry grass common to that region. In size it does not differ from a small ox, but there is long hair fringing the shoulders, sides, and tail. Its horns are long, smooth, and nearly cylindrical. The color of wild yaks is either dark brown or black, but those domesticated are lighter in color, even white specimens being quite common, and some are hornless. These animals have been domesticated to a considerable extent in Central Africa for their milk and hair, and they are employed as beasts of draught and burden. The milk is considered very rich and yields a curd valuable for food, both in the fresh and dried state. An excellent grade of butter is made of yak milk. Both the butter and flesh are important articles of commerce in Tibet, while the hair is utilized in making jackets, caps, and blankets, and the skin is of value as a leather product. The tail is used as a chowry, or fly flap, in India and Tartary. The domesticated yak differs quite as much in size, appearance, and usefulness as do the cattle raised in Canada and the United States. It is the inseparable companion and most trusty servant of the Tibetans and is used extensively by the people of Ladakh, Cashmere, Mongolia, and Urga. No animal is better fitted to endure cold.

YAKIMA (yăk'i-mä), a river of central Washington, which rises in the Cascade Mountains and flows in a general direction toward the southeast. It has a length of about 165 miles and flows into the Columbia some distance above Kennewick. The country along the Yakima includes fine agricultural land, and the river and its tributaries furnish water for irrigating a large region. It receives the inflow from the Natches River near North Yakima. The valley is traversed by the Northern Pacific Railroad almost the entire length.

YAKIMA, a confederacy of Indians in North America, formerly found in the eastern part of

Washington, but now confined on the Yakima Reservation, in the south central part of Washington. Lewis and Clark came in contact with them in 1804, and they ceded most of their land to the government by treaty and agreed upon the present reservation in 1855. At present they engage chiefly in stock raising and farming, for which purpose they employ irrigation. The Indians upon the Yakima Reservation number about 2,350, but less than half are Yakimas.

YAKUTSK (yā-kutsk'), capital of the province of Yakutsk, in eastern Siberia, on a tribu-

tary of the Lena River. The province includes nearly one-third of Siberia and is populated largely by Yakuts, Lamuts, and descendants of those exiled from Russia. It has a remarkably cold climate, the winters being long and severe,

but there is a steady increase in population. The city of Yakutsk is reached in the summer time by vessels sailing on the Lena, Viliui, and Aldan rivers, but in the long winters little commercial activity is manifested. Among the principal manufactures are candles, implements, utensils, earthenware, and clothing. It has a considerable trade in fur, live stock, and native products. Cossacks founded the city in 1632.

Population, 1916, 8,604.

YALE, Elihu, philanthropist, born in Boston, Mass., April 5, 1648; died in London, England, July 8, 1721. His father, Thomas Yale, settled at New Haven, Conn., in 1638, but afterward removed to Massachusetts and in 1651 returned to England. Elihu went to India, in 1670, where he established himself in trading. He became governor of the East India Company's settlement at Madras in 1687, serving in that capacity until 1692. In the meantime he acquired a large fortune and returned to England, in 1699. He did not return to America, but became interested in the educational welfare of New England and donated books and money amounting to about \$4,000 to the Collegiate School at Saybrook. When that institution was removed to New Haven, its name was changed to Yale College in his honor, and subsequently it became known as Yale University. He was buried in Wexham. Wales. On his tombstone is the familiar couplet:

> "Born in America, in Europe bred, In Africa traveled, and in Asia wed."

YALE, Linus, inventor, born in Salisbury, N. Y., April 4, 1821; died in New York City, Dec. 24, 1868. He first studied portrait and landscape painting, but soon turned his attention to mechanics. In 1850 he invented a key for bankers' safes and the famous Yale lock, which he afterward improved by successive inventions. His clockwork mechanism and combination locks completely revolutionized locks and safes, and gave him a place on the list of American inventors. He made a number of inventions and improvements in mechanics' tools, and perfected a device for adjusting the joiner's square at right angles. Bronze, silver, and gold medals were awarded to him at a number of national and international expositions.

YALE UNIVERSITY, an institution of higher learning in the United States, one of the most noted in America. It was founded as the Collegiate School of Connecticut at Saybrook, Conn., in 1698, but was removed to New Haven in 1716, where it was located permanently. Two years later, in 1718, it was renamed Yale College in honor of Elihu Yale, from whom it received valuable gifts. The consistent growth of the institution as a center of learning naturally caused it to become one of the leading universities of the country. As now organized it includes the graduate department, the academic department, the Sheffield Scientific School, the theological school, the law school, the medical

school, the school of music, the school of art, and the school of forestry. The courses are well classified and lead up to the usual univer-

sity degrees.

The campus of Yale University borders on the green of New Haven, being bounded by Elm, High, Chapel, and College streets. It has a very convenient and imposing location. The buildings include those of the university proper, the Sheffield Scientific School, the School of Fine Arts, the Peabody Museum of Natural History, and the University Library. At present there are 950;000 volumes in the general library. The annual income is about \$1,250,000. The general average attendance is 3,500 students. Fully 25,000 persons have graduated from the different departments. In October, 1901, was celebrated the two hundredth anniversary of the granting of a charter to Yale College, on which occasion President Roosevelt and other distinguished men made addresses. Among the eminent men who have been connected with the institution are Timothy Dwight, James L. Kingsley, Theodore D. Woolsey, Arthur T. Hadley, and William Howard Taft.

YALU (yä'lōō'), an important river in the eastern part of Asia, known in Corea as the Amnok or Apnok. It rises on the eastern border of China, flows in a general direction toward the southwest, and discharges into the Yellow Sea, forming the larger part of the northwestern boundary of the country. Several rapids obstruct its upper course, but it is navigable a distance of 145 miles, though seagoing junks do not ascend more than 30 miles. The entire course is 300 miles. In the war between Japan and China, the Japanese destroyed the fleet of China off the mouth of the Yalu, in 1894. The Japanese forced a passage of the mouth of this river in 1904, when it was the scene of important battles during the Pusca Japanese War.

tles during the Russo-Japanese War.

YAM, the common name of several species of

plants, having twining stems and edible, tuberous roots. The roots are eaten in much the same way as potatoes. They more nearly resemble the sweet potato than the common potato, but differ distinctly from both these products. Starch is the chief constituent and the taste is somewhat acrid when raw, but they become mealy and pleasant when boiled. Yams are cultivated chiefly in the tropical countries and are propagated by their tubers, which are planted in much the same way as potatoes. A light colored kind of sweet potato grown in the Southern States is commonly called yam, but is a different plant. The cinnamon vine is an ornamental plant belonging to the yams.

YAMAGATA (yä-ma-gä'tà), Aritomo, Marquis, soldier and statesman, born in the province of Choshu, Japan, in 1838. After acquiring a liberal education, he enlisted in the military service, and in 1868 took part in the revolution that overthrew the shogunate and restored the Mikado to power. He was made second vice min-

ister of war by the new government, and in 1869 was sent on missions to France and Russia. In 1878 he became commander of the imperial guard and in 1884 was created a count. He



ARITOMO YAMAGATA.

served as prime minister of Japan from 1889 to 1891, and in the latter year was appointed minister of justice. When the late war with China commenced, in 1894, he was made commander of the first army corps, with which he expelled the Chinese from

Corea. The Japanese government rewarded him for this service by creating him marquis. He visited the United States and Europe in 1896. In 1898 he was again made prime minister, but resigned in 1900 to retire from public life. Marquis Yamagata was a leading factor in introducing reforms and European methods into Japan.

YANCEY (yăn'sĭ), William Lowndes, orator and statesman, born in Ogeechee Shoals, Ga., Aug. 10, 1814; died July 28, 1863. He obtained the advantages of a college education and was admitted to the bar in South Carolina. In 1836 he removed to Alabama, where he edited the Catawba Democrat, and later the Wetumpka Argus. He was elected to Congress as a Democrat in 1844 and was reëlected at the succeeding election. In 1860 he attended the Democratic national convention at Charleston, S. C., but withdrew as an uncompromising extremist. Subsequently he traveled through the Southern States as an orator to advocate secession, visiting also many places in the North and East in opposition to the Republican candidates, and in 1861 reported the ordinance of secession in the convention at Montgomery, Ala. The Confederate government sent him to Europe shortly after the beginning of the Civil War as a special agent to secure recognition of the Confederate States by the European powers, but he returned after an unsuccessful mission. On returning to America, in 1862, he became a member of the Confederate Senate, but died a year later near Montgomery, Ala.

YANG-TSE-KIANG (yăng'tsê-kĭ-āng'), one of the principal rivers of Asia, which is situated wholly within China. It rises in the Kuenlun Mountains and, after a general course toward the southeast, makes a bold curve at the northern boundary of the province of Yun-Nan and flows toward the northeast, entering the Yellow Sea at Shanghai. The entire length is

3,200 miles, of which 900 miles are navigable by ships of the largest class and 1,500 miles by smaller steamboats. It is joined by the Han River from the north and by the Kan and Heng rivers from the south. Many important cities of China are located on its banks, and it is the seat of a vast interior and foreign trade. The valley is highly fertile, producing rice, cotton, tobacco, silk, and fruits.

YANKEE (yăn'kê), the name popularly applied in the United States to people residing in or coming from New England, but in Canada and Europe it has reference to all the people of the United States. The name originated from a misunderstanding of the word English by the Indians, who pronounced it yanghies and yemghies, and finally coined the word yankees. The British soldiers applied it as a term of reproach to the New England troops, in 1775, and they adopted it afterward. In the Civil War it was generally applied to the Northern people by those residing in the Southern States, while the latter became known as Johnnies.

YANKEE DOODLE, a popular air which is now regarded as one of the national tunes of the United States. It is thought to have originated in the time of the rebellion in England, when Cromwell was nicknamed Yankee Doodle and the following rhyme was applied to his entry into Oxford:

Yankee Doodle came to town Upon a Kentish pony; He stuck a feather in his hat, And called him Macaroni.

The tune of Yankee Doodle was played by the British troops at the time of the Revolution in derision of the New Englanders, who afterward adopted it as a popular air. It has become superseded quite generally by America and Hail Columbia. The Legislature of South Carolina, in 1861, enacted a law forbidding its use, it having become highly popular in the North at the beginning of the Civil War.

YANKTON (yănk'tŭn), a city in South Dakota, county seat of Yankton County, on the Missouri River, fifty miles above Sioux City, Iowa. Communication is furnished by the Chicago and Northwestern, the Great Northern, and the Chicago, Milwaukee and Saint Paul railroads. It is finely situated on an elevated site and is surrounded by a fertile farming region. Among the principal buildings are the county courthouse, the Yankton College, the hospital of the Sisters of Saint Benedict, the Saint Joseph Academy, the public high school, and the South Dakota Hospital for the Insane. It has manufactures of flour, earthenware, and utensils, and is the seat of extensive grain elevators and railroad shops. It has a growing trade in farm produce and merchandise. Yankton was settled in 1862 and incorporated in 1883. It was the capital of the Territory of Dakota until the latter year. Population, 1910, 3,787.

YARKAND (yär-känd'), a town of the Chi-

nese Empire, in Eastern Turkestan, on a headstream of the Tarim River, about 100 miles southeast of Kashgar. It is surrounded by a fertile region and protected by a high wall. Most of the houses are of sun-dried brick. The chief buildings include a citadel, an ancient palace, and numerous bazaars and mosques. It has manufactures of silk and cotton goods, woolen clothing, carpets, utensils, and dyestuffs. Formerly it was the center of a vast caravan trade, but the construction of railways in Russian and British territory has lessened its commercial importance. Intercommunication is carried on chiefly by narrow canals that intersect the streets. A larger part of the inhabitants are Chinese, Tartars, and Turks. Mohammedanism is the principal religion. Population, 1917, 85,500.

YARMOUTH (yär'mūth), a city of Nova Scotia, capital of Yarmouth County, 200 miles southwest of Halifax. It is situated at the entrance of the Bay of Fundy and on the Dominion and Atlantic and the Halifax and Yarmouth railways. The principal buildings include those of the county, the customhouse, the Grand Hotel, and several elementary and secondary schools. The manufactures consist principally of cotton goods, boots and shoes, machinery, and sailing vessels. It has large interests in fishing and canning. During the summer it is visited by a large number of tourists. Population, 1901, 6,430; in 1911, 6,600.

YARMOUTH, or Great Yarmouth, a seaport city and watering place of England, 122 miles northeast of London and 20 miles east of Norwich. It is situated conveniently at the mouth of the Yare River, has railroad facilities, and is noted as an important fishing station. The chief buildings include the Church of Saint Nicholas, the Walrond Home, and a number of charitable, benevolent, and educational institutions. It has a fine monument, 144 feet high, erected to the memory of Admiral Nelson. Among the manufactures are cordage, fishing nets, twine, silk and woolen textiles, leather, machinery, and sailing vessels. Fishing is the chief industry. The catches include herring, cod, mackerel, and whitefish. Population, 1911, 55,808

YAROSLAV (yär-ös-läf'), a city of Russia, capital of the government of Yaroslav, 165 miles northeast of Moscow. It occupies a fine sight on the Volga, has transportation facilities by the river and several railways, and is surrounded by a fertile farming country. The manufactures include flour and grist, cotton goods, pipe tobacco and cigars, white lead, and machinery. It is the seat of a theological seminary, a college and law school, and a cathedral dating from 1215. Yaroslav was founded in the 11th century and has been under the Russian government since the 15th century. Population, 1916, 73,810.

YARROW (yăr'rô), a river in the southern part of Scotland, in Selkirkshire. It rises at

Yarrow Clough, near Loch Skene, and flows into the Ettrick after a course of 25 miles. The current is rapid and furnishes an abundance of water power. Scott and Wordsworth made the stream famous by writing of the picturesque scenery along its banks.

YATES, Edmund Hodgson, novelist and journalist, born in London, England, in July, 1831: died there May 20, 1894. He studied in London and entered the post office service, but retired in 1872 to engage wholly in literary work. After editing the "Temple Bar Magazine," he became theatrical critic for the Daily News and contributed to All the Year Round and other periodicals. In 1872 and 1873 he made a lecturing tour of Canada and the United States, and soon after published "Personal Reminiscences and Experiences." His writings consist mostly of novels, many of them being interesting and entertaining. The best known works include "Kissing the Rod," "Pages in Waiting," "Wainwright's Patient," "The Impending Sword,"
"Running the Gauntlet," "Life and Correspondence of Charles J. Mathews," and "Recollections and Experiences."

YATES, Richard, war Governor of Illinois, born in Warsaw, Ky., Jan 18, 1818; died in Saint Louis, Mo., Nov. 27, 1873. His family removed

to Illinois in 1831, where he attended Illinois College, Jacksonville, and in 1838 began the practice of law at Springfield. In 1842 he became a member of the State Legislature, serving until 1849, when he was elected to Congress as a Whig, being the youngest representative in that body. He was elected Governor of Illinois in 1860



RICHARD YATES.

and reëlected in 1862. As a war Governor he took high rank as an enthusiastic supporter of the Federal cause, aided in raising troops, and was among the first to recognize the military ability of U. S. Grant. He served as United States Senator from 1865 until 1871, and was choser railroad commissioner shortly before his death. His son, Richard Yates (born in 1860), was elected Governor of Illinois as a Republican in 1901, serving until 1905.

YATES, Robert, jurist, born in Schenectady, N. Y., March 17, 1738; died in Albany, N. Y., Sept. 9, 1801. He attended school in New York City, studied law under William Livingston, and was admitted to the bar in 1760. Shortly after he settled in Albany, where he was chosen a member of the Provincial Congress, in 1775, and during the Revolution advocated the American cause by contributing articles to various periodicals and delivering numerous addresses. He was chief justice of the New York supreme court from 1790 to 1798 and subsequently served on commissions to settle disputes between New

York and Massachusetts in regard to territory. Later he was a commissioner in similar disputes between New York and Vermont.

YAWS (yas), the name of a contagious disease which is more or less prevalent in warm countries. Many local names are applied to it in different localities, such as tonga, bubas, and coko. The patient is generally covered with yellowish tubercles or granules, which may appear on any part of the body, and the period of the disease is from two to five months, but it may continue many years. Some consider it a form of leprosy. Mercury, arsenic, and sulphur are the principal drugs used in treating the disease. Yaws is a common malady in the West Indies, Ceylon, the East Indies, and the warmer parts of Africa and South America.

YAZOO (yăz'oo), a river in Mississippi, which rises in the northern part of the State, near Friarpoint, from several bayous thrown off by the Mississippi River. Later it is joined by the Yalobusha and the Tallahatchie and, after a general course toward the southwest, it flows into the Mississippi ten miles above Vicksburg. It is about 300 miles long and has a rather tortuous course, but is navigable at all seasons. Fertile cotton plantations are located along its banks. Yazoo City is the chief city on its banks.

YAZOO CITY, a city of Mississippi, county seat of Yazoo County, on the Yazoo River, 45 miles northwest of Jackson. It is on the Yazoo and Mississippi Valley Railroad and is surrounded by a fertile farming country, which produces large quantities of corn and cotton. The industries include lumber mills, machine shops, and cotton mills. It has several fine buildings, including the county courthouse and a number of schools. Population, 1910, 6,796.

YEAR, the period of time in which the earth completes a revolution around the sun, or in which the seasons pass through their changes. Owing to the fact that this period is not an exact number of days, there are many kinds of years, each differing somewhat in length. The period between two passages of the sun through the same equinox, which determines the changing seasons, is called the solar, tropical, or equinoctial year, and is constituted of 365 days, 5 hours, 48 minutes, and 48 seconds. The sidereal year, in which the sun apparently returns to the same stars, is equal to 365 days, six hours, nine minutes, nine seconds. It differs in length from the tropical year, owing to the precession of the equinoxes among the stars. The common year of 365 days, the integral number of days nearest to the solar year, is in popular use, and every fourth year is a leap-year of 366 days, except the centuries not exactly divisible by 400, as 1800 and 1900. Other years include the civil year of 365 days, the lunar year of twelve lunar months, and the ecclesiastical year counted from Advent to Advent.

YEAST, a fungus growth consisting of minute vegetable cells that collect and form a frothy substance of a yellowish color. When placed in contact with saccharine liquids, it develops or increases by germination, producing alcoholic fermentation and carbonic acid. Yeast is employed chiefly in the brewing of beer and the raising of bread. In the former it imparts the sparkling and stimulating qualities to the beer, while the carbonic acid causes porosity in the bread. A quantity of yeast is mixed with the dough, which is allowed to stand and rise for some time, and the dough is then made into loaves. The action of yeast is to produce a small quantity of alcohol and carbonic acid from the sugar present in the dough, the rising being due to the escaping carbonic acid. Yeast is now used very largely in all classes of bakery, although in the East, as in former times, leaven is still employed to a considerable extent. In Canada, the United States, and many countries of Europe yeast powders, or baking powders, are used very extensively as a substitute for yeast in bread making.

YEATS, William Butler, critic and poet, born at Dublin, Ireland, June 13, 1865. He attended schools in Hammersmith and Dublin, making a specialty of the study of art, but in 1886 turned his attention to literature. Being agreeably Irish as a writer, he awakened interest in the literature of Ireland and aided in founding the National Literary Society of Dublin. He visited Canada and the United States in 1903 and delivered a number of lectures. His chief works include "Countess Kathleen and Various Legends and Lyrics," "The Shadowy Waters," "Ideas of Good and Evil," "Wind Among the Reeds," "In the Seven Woods," and "The King's Threshold."

YEDDO. See Tokio.

YELLOW (yel'16), the color of the solar spectrum which is between the orange and the green. It is best represented by the lemon and canary yellow, and is the color of gold and of brass. Violet and yellow are complementary to each other, that is, if these two colors are mixed they will produce white light. Blue is made paler by increasing the light to which it is exposed, but an increase of light seems to strengthen the color of yellow.

YELLOW BIRD, an American bird of the finch family, which is widely distributed in North and Central America. It is about six inches long, with an alar extent of nine inches. The male has a bright yellow plumage in summer, while the female is yellowish-brown. A number of species have been catalogued, all of which are birds of pleasing song and are favorites as cage birds. They feed on insects and seeds, and in autumn gather in large flocks.

YELLOW FEVER, an acute, specific disease, which is epidemic in tropical countries. It was first made known to Europeans in the 15th century in connection with the discovery of America, and was so named from the yellow appearance of the skin seen in patients. Yellow

fever is thought to be caused by a specific virus, which becomes complicated with jaundice conditions, and at an advanced stage is accompanied by the vomiting of dark-colored matter called black vomit. It depends for its origin and diffusion on a temperature not lower than 70° Fahr., and its spread immediately stops when the atmospheric temperature falls to the freezing point.

In 1895 J. Sanarelli, of Montevideo, Uruguay, published the opinion that yellow fever is a toxic disease, induced by a poison generated by the bacillus icteroides, to which he gave the name amaril. Subsequent investigations of many yellow fever patients have confirmed that view. Infection takes place when the blood of a yellow fever patient is injected into healthy persons. Horses, cattle, monkeys, rats, and many other animals are subject to it. An antitoxic serum has been obtained by inoculating horses and oxen with virulent toxin, and it is thought that medical science will soon be able to apply effective treatment to this much dreaded contagion. However, wholesome sanitary measures, such as were introduced in the Panama Canal zone by the United States, are the most effective preventives.

In 1878 a very fatal epidemic of yellow fever ravaged New Orleans, continuing from May to October, and 4,125 persons succumbed to its attacks. The disease is most prevalent in Central America, the West Indies, portions of Mexico, and the tropical countries of Africa. It is frequently carried to the gulf states and other sections of America. An epidemic prevailed in Cuba, Brazil, Mexico, and Central America in 1900. In 1905, during an epidemic at New Orleans, it was clearly shown that the bites of a certain species of mosquitos, the Stegomyia fasciata, are the cause of spreading the disease. This accounts for the fact that the appearance of a frost causes it to abate or to be stamped out entirely

YELLOW-HAMMER, a common European bird of the bunting family. It is about seven inches long, has an expanse of wings of eleven inches, and the male has a bright yellow head and throat. This bird is common in the wooded districts of all parts of Europe and during the winter is seen with the finches and sparrows. The name yellow-hammer is applied to the flicker, or golden-winged woodpecker, in the United States.

YELLOWLEGS, the name of two species of snipes found in North America, especially along the Atlantic coast. The common yellowlegs is ten inches long and is much prized for its flesh. The greater yellowlegs is somewhat larger. These birds migrate north as far as Nova Scotia, and in autumn pass south to the West Indies and South America. Hunters sometimes call them tatlers, or yelpers, owing to their peculiar noise when flying from danger.

YELLOW SEA, an extensive inlet of the Pacific Ocean, lying between Corea and China

and merging into the Gulf of Pe-chi-li. It is 600 miles in length and 400 miles wide, and is largely a shallow expanse of the sea. This is due to the large amount of silt carried into it by the Yang-tse-Kiang and Hoang-ho rivers. Shanghai, Kiao-chau, and Seoul are the chief cities on the Yellow Sea, and Port Arthur and Tien-Tsin are on the Gulf of Pe-chi-li. It has valuable fisheries and is important for its commerce.

YELLOWSTONE, a river of the United States, which rises in Yellowstone Lake, a fine sheet of water in the northwestern part of Wyoming. It has a general course toward the north until reaching Livingston, Mont., where it assumes a northeasterly direction and flows into the Missouri near the boundary of North Dakota. The chief tributaries are the Powder, Big Horn, and Tongue rivers, all of which rise in Wyoming. The Yellowstone is 625 miles long and a portion of this distance is navigable for small vessels. A number of beautiful cañons are situated in its upper course, especially the Grand Cañon, which is 1,500 feet deep. Near the exit of the river from the lake is a belt of hot springs three miles long and a half of a mile wide. About fifteen miles below the lake the river plunges over two precipices, the upper being 112 feet high and the lower 310 feet high. Yellowstone Lake is 7,375 feet above sea level and has an area of 300 square miles. Its shores are picturesque, being characterized by rugged cliffs, and it has excellent trout and other fisheries.

YELLOWSTONE NATIONAL PARK, the most wonderful natural park in the world, which is situated in the northwestern part of Wyoming. A small strip along the eastern side is included with Idaho and a tract in the northern part belongs to Montana. The reservation was set apart as a public park by the national government in 1872. It has an area of about 3,575 square miles, is 62 miles in length from north to south, and has a width of 54 miles. Near it is the Yellowstone Park Forest Reserve, which adjoins the park on the south and the east, increasing the area to 5,500 square miles.

The park has an abundance of rainfall, thus giving it beautiful ponds and lakes, numerous streams, and excellent vegetation. Yellowstone, Shoshone, Lewis, and Heart lakes are the chief bodies of water, and the principal drainage is by the Yellowstone River. The Madison River, a tributary of the Missouri, drains the eastern part, and the Snake River, a tributary of the Columbia, has its source in the southern part. This park contains some of the most beautiful natural curiosities in the world, including about 25 waterfalls, 100 geysers, and 4,000 hot springs. Many of the springs are laden with minerals, such as the Mammoth Hot Springs, which are situated near the northern entrance to the park. Although the general surface ranges from 6,980 to 8,500 feet above the sea, 24 peaks exceed an altitude of 10,000 feet.

The Grand Cañon of the Yellowstone, with its vast volume of water rushing at great depths; many snow-capped mountains, towering about 10,000 feet above sea level; the Grand, Old Faithful, Giant, Giantess, and Bee-Hive geysers; and numerous cascades and waterfalls are among the natural curiosities to be viewed by the tourist. In this great natural zoölogical garden are

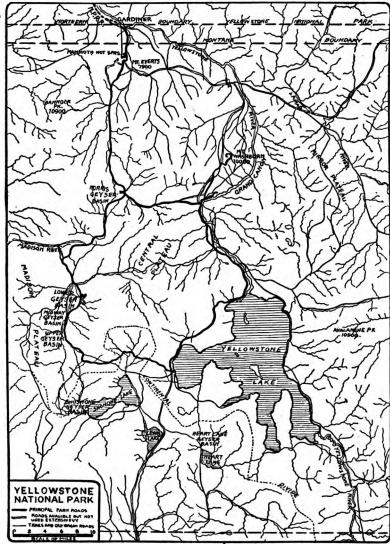
ers, thus giving travelers an excellent opportunity to find recreation in angling.

The park is reached most conveniently from Livingston, Mont., by the Northern Pacific Railway, which has its terminus at Gardiner, a small town at the northern boundary of the park. The main entrance is through a stone arch built by the Federal government, which bears the inscrip-

tion, "For the Benefit and Enjoyment of the People." Other gate-ways are reached from Cody, Wyo., on the east, and from Monida, Idaho, on the west. Many beautiful walks and drives are maintained in the park, with fine villa and hotel accommodations. Adequate protection to tourists is provided by the government. Transportation companies convey the tourists by carriages in regular trips through the park, the principal points of which may be visited in six days. June and July are the most favorable touring months.

YEMEN (yĕm'ĕn), a region in the southwestern part of Arabia, constituting a villayet or province of the Turkish Empire. It is bounded on the north by Hedjaz, east by Arabia, south by the British protectorate of Aden, and west by the Red Sea. The area is about 74,500 square miles, but in a larger sense the section includes all of the region lying between Syria and the Strait Bab-el-Mandeb. It has a hilly and mountainous surface, but the valleys are rich in tropical and subtropical vegetation. The

coast is hot and arid in some parts of the year. Stock raising is the principal occupation, but the country produces large quantities of coffee and fruits. Yemen was made a part of Turkey in the 16th century. It belonged to the Arabs from 1630 until 1872, and since then it has remained a part of the Ottoman Empire. Medina and Mecca are the principal and most noted towns of Yemen. Sana, in the southern part, is the



MAP OF YELLOWSTONE NATIONAL PARK.

beautiful forests, in which are protected herds of buffalo, deer, elk, antelope, and other animals. Tourists often marvel at the peculiar tameness of the animals in the park, especially the bear, which is due to the fact that they receive marked care and are under protection of the laws of the United States. The government has planted German, brook, and rainbow trout, whitefish, and other species in the lakes and riv-

nominal capital and Hodeida and Loheia are the chief ports. Population, 1915, 750,500.

YEN, a coin of Japan, the monetary unit of that country. It was minted in both gold and silver until 1897, when the gold standard was adopted, and since that time it has been coined chiefly in larger denominations than the single yen. The value of the gold yen is about \$0.99 and of the silver yen, about \$0.52. Coins in the denominations of 20 yens in gold, equal to \$9.97, are circulated more generally than the smaller denominations. A yen is divided into 100 sens, which are coined in bronze. The coin of 5 sens is coined in nickel; the 10-sen, the 20-sen, and the 50-sen pieces are in silver. The sen is divided into 5,000 rin, and this is coined in bronze in the denomination of 5 rins.

YENIKALE (yĕn-ê-ka-lā'), Strait of, a narrow passage which separates the western extrem-



GRAND GEYSER.

Caucasus from the Crimean Peninsula and forms the connection between the Black Sea and the Sea of Azov. The strait is 25 miles long and about three miles wide at its narrowest place. It contains numerous shoals. In the central part is an expansion, known as the Harbor of Kertch, and the stretch south of it is usually called the Strait of Kertch.

ity of the

YENISEI (yĕn-ē-sā'ē), an important river of Asia,

which rises in northern China by two branches, the Bey-Keme and the Onlon-Keme, and flows into the Gulf of Yenisei, an inlet of the Arctic Ocean. The upper course is toward the west, but it assumes a general course toward the north near the boundary of Siberia and, after receiving the Upper Tunguska, flows toward the northwest. A number of falls and rapids are in its upper course, but the larger part of it is through great steppes and it receives numerous tributaries. It is navigable only in the summer months, owing to the cold climate. It has a total length of 3,000 miles. The basin contains

1,100,000 square miles. The Angara River, which merges into the Upper Tunguska, is the outlet of Lake Baikal. The Yenisei is navigable to Turukansk.

YERKES, Charles Tyson, capitalist, born in Philadelphia, Pa., June 25, 1837; died Dec. 29, 1905. He attended the public schools in Philadelphia, began business as a clerk in the grain commission trade, and in 1858 opened an office as an exchange broker. In 1861 he went into the banking business, dealing extensively in bonds, and in 1871 failed in business and was forced to make an assignment. Having dealt in bonds of the city of Philadelphia and being in debt for a large amount, he was convicted of misappropriating public funds and for a time was in prison, but afterward it was decided that the conviction was illegal. He gained financial advantage by the failure of Jay Cooke in 1873 and invested in the street railways of Philadelphia. In 1886 he secured control of the North Side and the West Side street railroads and the elevated railway corporations of Chicago, which he improved and enlarged. As a director of the World's Columbian Exposition, Chicago, he rendered efficient service and made a loan of his private collection of paintings to the department of fine arts. Subsequently he financed and managed an extensive line of underground railways in London. He made a gift of \$400,000 to the University of Chicago, to establish at Lake Geneva, Wis., the Yerkes Observatory, one of the most famous institutions of the kind in the world.

YESSO (yes'so), Jesso, or Yezo, the most northerly of the principal islands included in Japan. It is separated from Hondo by Tsugaru Strait. The island is mountainous and volcanic, but has excellent timber and fine minerals. Mount Tokachi-dake, height 8,210 feet, is one of the most elevated peaks. The Ishikari, length 407 miles, is the chief river. Among the minerals are gold, silver, iron, and coal, and there are valuable fisheries in its streams and off the coasts. Sheep, cattle, horses, and cereals are grown in abundance. Yesso has an area of 36,299 square miles and a population of 926,582. Hakodate is the chief city and the capital.

YEW (ū), an evergreen tree with spreading branches, solid and massive trunk, and dense, dark green foliage. Naturalists have catalogued many species, all of which yield wood of a fine, close grain, which is very durable and valuable for architectural and manufacturing purposes. Many species are now cultivated, especially as ornamental trees, either for separate growth or for hedges. The best known species include the California yew, Mexican yew, Irish yew, and Japan yew. Yew trees have a slow growth and a long life, some species attaining an age of 300 to 500 years, and the leaves contain a potent narcotic principle. The yew tree is commonly called hemlock, and the poisonous properties are referred to in the classical writings of Virgil,

Livy, Plato, and Caesar. Though poisonous to

3207

some extent when in a state of growth, the leaves develop a larger per cent. of poison when undergoing fermentation in large piles or heaps.

YGDRASIL (ig'dra-sil), in Scandinavian mythology, the name of the most sublime of all trees, the ash, whose branches were supposed to reach from earth to heaven. It was regarded the symbol of the universe. The fountain of wisdom was beneath one of its roots, and under its bows was a familiar meeting place of the gods. Some writers regard it as the source of the Christmas tree.

YIDDISH, the language spoken by a large proportion of the Jews, but particularly in the eastern part of Europe. The name is from the German word jüdisch, meaning Jewish, and applies to the most widely spoken dialect of the Jewish people. German was spoken and written with facility by the Jews in Germany up to the 14th century, when large numbers migrated to the Slavic lands in the eastern part of Europe, to which they brought the German language as spoken at that time. Later the German underwent many changes through the influence of Luther and the development of a larger literature, hence, when the Jews returned to Germany in the 17th and 18th centuries, they continued to speak a vernacular which was based on the German of the Middle Ages. However, many of the newer words were intermingled with the spoken tongue and a large number of Hebrew terms continued to be used, which resulted in finally developing a characteristic but largely German dialect. Ultimately this language was carried to all parts of the world where the Jews of this class founded homes. It is now heard in practically all the Ghettos in America and Europe. The literature of this language is very extensive.

YOKOHAMA (yō-kō-hā'mā), a large port city of Japan, in the island of Hondo, eighteen miles southwest of Tokio. It has good railroad facilities and a commodious harbor on Tokio Bay, and is noted as a trade and manufacturing city. The chief buildings include the customhouse, several institutions of higher learning, the official residences, and a number of temples and synagogues. Among the principal manufactures are embroidery, clothing, porcelain, leather, silk and woolen textiles, soap, edged tools, hardware, and machinery. Many of the streets are paved substantially and are improved by avenues of trees, drainage, and gas and electric lights. An extensive system of rapid transit has been introduced recently under government sanction. It has a large trade in rice, silk, woolens, tea, cotton, and porcelain. The edifices include several Christian churches, many fine schools, and a large number of temples. Yokohama is a modern city and owes its importance to a treaty whereby the port of Tokio became open to foreign trade in 1859. At that time it was only a small fishing village and the chief

business was transacted at Tanawaga, but the latter was soon after abandoned and Yokohama grew rapidly in population and commercial importance. The harbor is now protected by a granite breakwater. It has extensive docks and wharves. Population, 1916, 392,684.

YOKOSUKA (yō'kô-sōō'kà), a seaport and naval station of Japan, on the western shore of the Bay of Tokio, twelve miles south of Yokohama. It has a fine harbor on the Bay of Yedo and is connected by railways with the leading cities of the island of Hondo. The chief industries include shipbuilding, machine shops, brick and pottery works, and flour and grist mills. It has a number of fine schools and several temples of considerable size. Electric lighting, waterworks, and sewerage systems are maintained. Population, 1918, 31,246.

YONGE (yung), Charlotte Mary, novelist, born at Otterburn, England, in 1823; died March 24, 1901. Her parents gave her a careful education under private tutors at home, fitting her for a successful literary career. She was editor of the Magazine for the Young a number of years and edited the Monthly Packett more than a quarter of a century. Many of her novels were first published in these periodicals and her total productions were issued in about 125 volumes, devoted chiefly to historical and educational themes. The best known of her novels is "Heir of Redclyffe," which is characterized by a religious and spiritual sentiment. Other works from her pen are "Catherine of Aragon and the Sources of the English Reformation," "Life of the Prince Consort," "The Daisy Chain," "The Dove in the Eagle's Nest," and "Life of Hannah More."

YONKERS (yŏn'kerz), a city of New York, in Westchester County, on the Hudson River, and on the New York Central Railway, ten miles north of New York City. It is situated on a beautiful site elevated about 415 feet above the river, has extensive electric street railway facilities, and is a popular residence of New York business men. The principal buildings include the public library, the Federal post office, the city hall, the Saint John's Riverside Hospital, the Woman's Institute Library, the Saint Joseph's Seminary, the Hebrew Home for the Aged and Infirm, and the Greystone House, which was once the residence of Samuel J. Tilden. Among the manufactures are textiles. lead pencils, carpets, hats, sugar, steam engines, clothing, machinery, and farming implements. The city has a large trade in farm produce and merchandise. Yonkers was settled by the Dutch in 1650. The ground upon which it stands was included in the Philipse Manor from 1672 to 1779. It was organized as a township in 1778 and became a village in 1855. In 1872 it was incorporated as a city. Population, 1905, 61,-716; in 1910, 79,803.

YORK, a city in Nebraska, county seat of York County, on the Chicago and Northwestern and the Chicago, Burlington and Quincy railroads, fifty miles west of Lincoln. The surrounding country is fertile, producing cereals, vegetables, hay, and fruits. Among the principal buildings are the county courthouse, the high school, the public library, the School of the Holy Family, and the York College, a United Brethren institution. Telephones, electric lighting and waterworks are among the improvements. York was settled in 1871 and incorporated in 1880. Population, 1910, 6,235.

YORK, a city of Pennsylvania, county seat of York County, 28 miles southeast of Harrisburg, on the Wabash, the Pennsylvania, the North Central, and other railroads. The surrounding country is agricultural and dairying. Among the chief buildings are the handsome granite courthouse, the York County Academy, the high school, the Federal building, the city hall, the opera house, the public library, the orphans' home, and the York Collegiate Institute. Penn and Farquhar parks are fine public resorts.

York has a large trade and is important as an industrial center. It has manufactures of boots and shoes, railway cars, furniture, tobacco products, clothing, machinery, and hardware. The city has well-paved streets, electric and gas lights, electric street railways, waterworks, and other municipal improvements. It was founded in 1741 and was the seat of the Continental Congress in 1777, when the British occupied Philadelphia. The place was incorporated as a borough in 1787 and as a city in 1887. Population, 1900, 33,708; in 1910, 44,750.

YORK, a river in Virginia, which is formed by the junction of the Mattapony and Pamunkey rivers, constituting an estuary forty miles long and from one to three miles wide. Eleven miles from its mouth is Yorktown, which was the scene of the surrender of Lord Cornwallis, on Oct. 19, 1781. At its mouth is a noted lighthouse.

YORK, a city of England, in Yorkshire, at the junction of the Foss and Ouse rivers, about eighteen miles northeast of Leeds. The city is the converging center of several important railroads and is surrounded by a fertile farming and dairy region. Among the chief buildings are the cathedral, the archbishop's palace, the Saint Peter's School, a school for the blind, and numerous other educational, benevolent, and charitable institutions. Its cathedral, known as the York Minster, was founded in the 7th century. It has a tower 213 feet high. Many of the streets are narrow and antique in appearance, but the main portion of the city is paved substantially and has gas and electric lighting, sewer drainage, telephones, and rapid transit. Among the manufactures are glass, flour, leather, confectionery, spirituous liquors, ironware, clothing, and machinery. York ranks as one of the oldest cities in England and there are evidences that it had considerable importance before the Roman invasion. It was the chief seat of Hadrian and the death place of Severus. Henry II. made it the seat of the first English Parliament, in 1160. James II. took away its charter, in 1688, for its opposition to his policies. Population, 1911, 82,297.

YORK, George Frederick Ernst Albert. See Prince of Wales.

YORK, House of, a dynasty of English kings, which was founded by Richard, Duke of York. He claimed the throne in opposition to Henry VI., who had been crowned king as a representative of the Lancaster line and ultimately took up arms, the wars that followed being known as the Wars of the Roses. By virtue of a compromise it was agreed that Henry should remain king until his death, and that the succession should then pass to Richard and his heirs. Queen Margaret repudiated this compromise and Richard took up arms, but was slain in the Battle of Wakefield. The Wars of the Roses finally terminated in favor of the Yorkists and Richard's son, Edward IV., was proclaimed king in 1461. He reigned until 1483, when his eldest son, Edward V., succeeded him, but was murdered two and a half months later by his uncle, Richard III., who was slain in the Battle of Bosworth in 1485. The Tudor dynasty then succeeded to the throne in the person of Henry Tudor, Earl of Richmond, who united the houses of York and Lancaster by marrying the daughter of Edward IV., and was crowned as Henry VII.

YORKTOWN, a town and the county seat of York County, Virginia, on the York River, eleven



SIEGE OF YORKTOWN IN 1781.

miles from its mouth and sixty miles southeast of Richmond. Communication is furnished by several steamship lines. The features include the customhouse, the county buildings, and several schools and churches. It was platted as a town in 1705 and at one time had considerable

importance as a commercial center, but the Revolution and the Civil War left it in a ruined condition.

Yorktown is noted for two famous sieges, one in the Revolution and one in the Civil War. On Oct. 19, 1781, the British troops under Lord Cornwallis surrendered at Yorktown to the Americans under Washington. The British had possession of Yorktown and defended it with 8,000 men, while the American army under Washington consisted of 9,000 men and the French troops under Lafayette numbered 7,000. This surrender practically ended the Revolution. The second siege of Yorktown took place in 1862, when the Confederates under General Magruder held the place, but that commander was superseded by General Johnston, who commanded an army of 53,000 men. General McClellan besieged the place with an army of 120,000 men, but the Confederates succeeded in withdrawing their forces. In 1879 a fine monument of the Corinthian style was erected at Yorktown to commemorate the surrender of Cornwallis. Population, 1910, 136.

YORK VON WARTENBURG, Hans David Ludwig, noted soldier, born in Potsdam, Germany, Sept. 26, 1759; died Oct. 4, 1830. He

Wartenburg, for which he was made a count. Subsequent to the return of Napoleon from Elba he took a leading part with the German army, and in 1821 was made field marshal. At Berlin is a fine statute of him by Rauch.

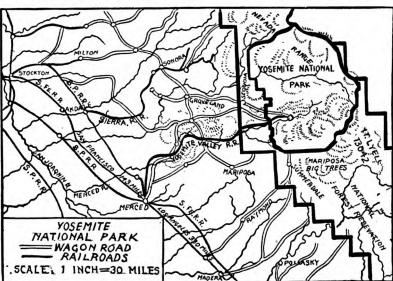
YOSEMITE (yō-sem'i-te), a famous and beautiful valley in Mariposa County, California, 150 miles southeast of San Francisco. It rivals in grand and magnificent scenery the Yellowstone National Park and is famed for its purling brooks, bubbling waterfalls, splendid foliage of trees, and gayly decked birds of song. The valley is seven miles long and about a mile wide, but its boundary lines wind in and out among the adjacent mountains, which rise to heights of from 4,500 to 5,280 feet. Among the beautiful and scenic places are those known as Sentinel Rock, 2,275 feet high, Cathedral Rock, the Spires, the Three Brothers, the Cloud's Rest, and the Bridal Veil Falls. This falls drops 2,660 feet by three plunges and is counted among the most beautiful in the world. Through the valley flows the Merced River, forming not only the Bridal Veil Falls, but several others of great beauty, the whole series constituting a sublime panorama of nature.

Tourists from all parts of the world are at-

tracted to the Yosemite valley, not only because of its grand scenery, but also because of its mild and beautiful climate and the great forest trees growing in the valley and in its vicinity. The valley was first discovered by white men in 1855. An act of Congress, passed in 1864, transferred the valley to the State of California with the condition that it should always remain a public resort. However, since 1890 it has

been known as the Yosemite National Park. A large part of the adjacent country is included in the National Forest Reserve, which contains the big trees of Mariposa. Tourists find the period from May to September the most agreeable for visiting the valley. A place known as Inspiration Point, near the entrance, is counted the most beautiful situation from which to obtain a general view. The gateway of the park is reached by the Yosemite Valley Railroad, which communicates at Merced with the Southern Pacific and the Atchison, Topeka and Santa Fé railways.

YOUMANS (yoo'manz), Edward Livingston, scientist, born in Coeymans, N. Y., June 3,



attended several schools and gymnasiums and enlisted in the Prussian military service. Subsequently he entered the army of Holland for service in India, where he remained from 1783 until 1784. He became major general in the Prussian army in 1807, was captured by the French in the Battle of Lübeck, and in 1812 commanded a detachment of Prussian troops against Napoleon in his Russian campaign. In 1813 he defeated Eugene de Beauharnais at Dannigkow and at Bautzen covered the retreat of the allies. He distinguished himself in the Battle of Katzbach and defeated Bertrand at

3210

1821; died in New York City, Jan. 18, 1887. He attended the public schools in Saratoga and afterward studied medicine and chemistry. In 1852 he published his first text-book in science, but subsequently devoted nearly twenty years to the study of scientific subjects and to writing texts on those and related topics. He established the Popular Science Monthly, in 1872, in New York City, of which he was editor and manager until his death. The University of Vermont conferred the degree of medicine upon him. His chief writings include "Correlation and Conservation of Force," "Alcohol and the Constitution of Man," "Culture Demanded by Modern Life," "Class Book of Chemistry," "Handbook of Household Science," and "Chemical Atlas."

YOUNG, Brigham, celebrated Mormon leader, born at Whitingham, Vt., June 1, 1801; died in Salt Lake City, Utah, Aug. 29, 1877. He



BRIGHAM YOUNG.

was the son of a farmer, spent his early life in pursuing agricultural arts, and obtained the advantages of a common school education. Later he learned the trade of a painter and glazier, but devoted himself diligently to selfimprovement by

cultivating studious habits. In 1831 he was converted to Mormonism and soon became an intimate associate of Joseph Smith. He joined the settlement at Kirtland, Ohio, in 1832, was made one of the twelve apostles in 1835, and was chosen president and prophet on the death of Joseph Smith in 1844. When the Mormons were forcibly expelled from Nauvoo, Ill., he faced the difficulties with remarkable fortitude and led the larger part of the Mormons over the great plains and across the Rocky Mountains to Great Salt Lake, where he founded Salt Lake City in 1847.

By reason of remarkable perseverance and determination the mountain streams were conducted across the valleys and lowlands to irrigate the soil, and the region of Great Salt Lake was converted from a desert waste to a country productive and fertile. In 1849 he organized a State government, which he named the State of Deseret, but the United States authorities refused to sanction the new State. Utah was organized as a Territory in 1850 and Young served as Governor until 1854, when a gentile was appointed to succeed him in that office. A series of troubles arose which resulted in the government sending troops, thus compelling obedience to the Governor appointed by Federal authority. Young promulgated the so-called celestial law of marriages in 1852, which he claimed had been revealed to Joseph Smith, and accordingly instituted polygamy. This resulted in a large party leaving the organized church and establishing a branch that repudiated plural marriages. He is said to have had 19 wives and about 56 children. His fifteenth wife began proceedings in court for a divorce in 1875. Seven widows and 44 children, 16 sons and 28 daughters, survived him. Young was a man of remarkable strength of character, great shrewdness, and undoubted ability. His energy and thrift is not only exemplified by his large personal and religious following, but by the cities and institutions existing on account of his persistent efforts. He founded the beautiful Mormon temple in Salt Lake City, encouraged agriculture, developed manufactures, and promoted the building of several railroads. About 30,000 persons attended his funeral, which was celebrated with imposing ceremonies.

YOUNG, Charles Augustus, astronomer, born at Hanover, N. H., Dec. 15, 1834. He studied at Dartmouth College and became a teacher at Phillips Academy, Andover, Mass., in 1854. The following year he took up the study of theology at Andover Seminary and in 1856 became professor of mathematics and natural philosophy in Western Reserve University, Ohio, but the following year accepted the professorship of astronomy and natural philosophy at Dartmouth. He accepted the chair of astronomy at the College of New Jersey, Princeton, in 1877. He made many discoveries in astronomy, including the spectrum of the corona and the presence of sulphur and strontium in the sun. His books include "Elements of Astronomy," "The Sun," "Uranography," and "Manual of Astronomy,"

YOUNG, Edward, author, born in Upham, England, in 1684; died April 12, 1765. He studied at Winchester School and at Oxford, and afterward became tutor in the family of the Earl of Exeter. His writings consist mostly of poems and tragedies, and many expressions taken from them have passed into proverbs, including such as "All men think all men mortal but themselves" and "Procrastination is the thief of time." Among his best known works are "Night Thoughts on Life," "Force of Religion," "Love of Fame," and "Poem on the Death of Queen Anne."

YOUNG, John Russell, journalist, born in Downington, Pa., Nov. 20, 1841; died in Washington, D. C., Jan. 17, 1899. He studied in the public schools of Philadelphia and New Orleans, and in 1857 entered the office of the Philadelphia Press as copy boy. At the beginning of the Civil War he joined the army of the Potomac as correspondent, and in 1864 accompanied General Banks on the Red River expedition. He settled in New York City after the close of the war and contributed to the New York Tribune, but resigned after three years to be admitted to the New York bar. In 1870 he established the New York Standard, which was not a financial success, and the following year went to Europe



(Opp. 3210) · ELLA FLAGG YOUNG.

Ella Flagg Young, the noted educator, was born at Buffalo, New York, Jan. 15, 1845. She graduated from the Chicago High School and the Chicago Normal School and was awarded a degree at the University of Chicago. In 1868 she married William Young but continued teaching, filling responsible positions in the public schools of Chicago. She was elected superintendent of the Chicago schools in 1909, which position she filled with success, and in 1910 was elected president of the National Educational Association, a recognition to which she was eminently entitled.

. .

as a correspondent of the New York Herald. He accompanied General Grant on his tour of the world as correspondent from 1877 to 1878 and later published "Around the World with General Grant." In 1882 he was appointed minister to China by President Arthur and, on returning to the United States, in 1885, became connected with the Philadelphia Star. President McKinley appointed him librarian of Congress in 1897, which position he filled with much efficiency until his death.

YOUNG, Samuel Baldwin Marks, soldier, born in Pittsburg, Pa., Jan. 9, 1840. He entered the Federal army as a private at the beginning of the Civil War, in 1861, and was mustered out of the service in 1865 with the rank of brigadier general. The following year he entered the regular army as second lieutenant, but was soon promoted to be a captain. In 1898 he was made a brigadier general for service in the Spanish American War and served under General Shafter in the campaign against Santiago. He was sent to the Philippines in 1901, where he was made military governor of the northwestern part of Luzón. After his return to the United States he commanded the department of California and was made chief of staff of the army in 1903. The following year he retired by operation of law.

YOUNG GERMANY, the name applied to a school of German writers, of whom Laube and Heine were the foremost representatives. These writers came into prominence about the middle of the 19th century. Their prevailing spirit was to displace romanticism, emancipate the Jews, and separate the church from the state. As writers they maintained the principles of democracy

and rationalism.

YOUNG ITALY, a society established in Italy in 1831, under the direction of Mazzini. It had for its purpose the union of the Italian people under an independent government, which it sought to attain by a revolutionary movement. Savoy was invaded by a military force under Mazzini in 1834, but this movement resulted in a failure. However, the feeling for unification of Italy was strengthened and the monarch of Sardinia became the leader in the purpose, and the end sought was finally accomplished by Victor Emmanuel in 1871.

YOUNG MEN'S CHRISTIAN ASSOCIA-TION, a religious society founded in London. England, by George Williams, in 1844, but which now has branch organizations in all the continents. In 1908 it had organizations in 3 countries of Australasia, 5 of Africa, 9 of Asia, 10 of North and South America, and 24 of Europe. purpose is to improve the spiritual condition of young men, but active membership is limited to members of evangelical churches. Others are taken in as associate members and are entitled to all the privileges and benefits, except holding office and voting on questions affecting the constitution. The first association in America was founded in 1851, but there are now 2,040 associations in the United States and about 260 in Canada. Prosperous organizations are maintained in Mexico, South America, and the West Indies, the total membership in America being 826,348 persons. The American associations have property valued at \$99,642,863.

The associations generally, besides conducting religious services, provide for the benefit of the members libraries and reading rooms, bath rooms, gymnasia, lectures, and special instruction in various branches. In most cases they aim to obtain employment for the members. There are 900,000 volumes in the libraries of these associations in the United States. About \$35,000,000 was subscribed in the United States in 1917 to expend near the firing lines in Europe.

YOUNGSTOWN (yungz'toun), a city in Ohio, county seat of Mahoning County, 67 miles southeast of Cleveland, on the Erie, the Pennsylvania, the Baltimore and Ohio, the Lake Shore and Michigan Southern, and other railroads. It is surrounded by a fertile farming and dairying region, which contains extensive deposits of bituminous coal. Among the chief buildings are an excellent county courthouse, the Federal building, the public library, the Park Theater, the Elks' and Odd Fellows' halls, the Y. M. C. A. building, the Children's Home, and many schools and churches. The streets are paved substantially and have gas and electric lights, sewer drainage, and waterworks. They are traversed by an extensive electric street railway system. Among the manufactures are hardware, vehicles, soap, brooms, machinery, engines, boilers, furniture, railway cars, bridges, and farming implements. The city has a large trade in merchandise, cereals, and fruits. The place was settled by John Young in 1797. It was made the county seat in 1874. Population, 1900, 44,885; in 1910, 79,066.

YOUNG WOMEN'S CHRISTIAN ASSO-CIATION, an organization having the fourfold purpose of ministering to the social, physical, mental, and spiritual wants of young women. The work of this society is promoted in much the same way as that of the Young Men's Christion Association and in the influence for good it keeps pace with that institution. It was founded as an international association in 1886, but national organizations date from a period several decades earlier. The local organizations are well represented in the cities of Canada and the United States. At present there are 948 associations in the latter country, with a membership of 330,045. State organizations are maintained in nearly all the states. The Evangel, a monthly publication issued in Chicago, is an official organ. About 1,340 branches are maintained in Great Britain, 500 in Germany, 425 in Denmark, and 300 in France. Equally strong organizations have been established in many other countries.

YPSILANTI (ĭp-sĭ-lăn'tĭ), a city of Michigan, in Washtenaw County, on the Huron River, thirty miles west of Detroit. It has communication by the Michigan Central and the Lake Shore and Michigan Southern railroads. The surrounding country is a fertile farming and fruit-growing region. The features include the city hall, the high school, the public library, and the Michigan State Normal College. It has electric railway facilities, electric and gas lighting, waterworks, and sanitary sewerage. Among the chief manufactures are furniture, silk goods, woolen and cotton textiles, paper, flour, vehicles, and machinery. The place was settled in 1825 and incorporated in 1858. Population, 1904, 7,587; in 1910, 6,230.

YTTRIUM (it'tri-um), a rare metal discovered by Gadolin in 1794, so named from Ytterby, Sweden, where the minerals containing it were first found. It occurs in small quantity as a component of several scarce minerals, such as allanite, gadolinite, and tankelite. Yttrium is a grayish powder, has no odor or taste, and is soluble in the carbonates of the alkalies. When burnished, it assumes the luster and color of metallic iron. More or less crystalline salts are formed by uniting yttrium with sulphur, iodine,

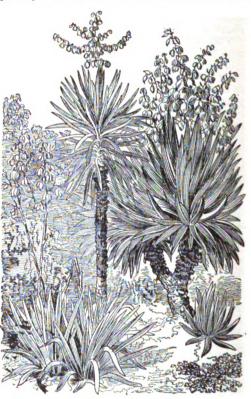
or phosphorus.

YUCATAN (yoo-ka-tan'), a peninsula of North America, lying south of the Gulf of Mexico and extending between the Gulf of Campeachy and the Caribbean Sea. It is separated from Cuba by Yucatan Channel and constitutes two states of Mexico, Campeche and Yucatan, with an area of 55,425 square miles. The three bays of Ascencion, Espiritu Santo, and Chetumal indent the eastern shore, where a number of well-protected harbors are formed. A number of productive islands lie off its coast, especially toward the east and north. The surface is generally level, but through the central part extends a chain of hills. A large portion of the interior has fine forests of valuable timber, such as rosewood and mahogany. The Usumacinta is the only river of importance, which forms a part of the western boundary of the state of Campeche. Among the productions are tobacco, coffee, maize, vanilla, cotton, rice, indigo, sugar cane, fruits, and vegetables. Horses, cattle, sheep, and swine are reared in abundance.

Yucatan is inhabited chiefly by Indians of the Maya race, and only about one-fifth of the people are of Spanish descent. Many ruins of magnificent pyramids, palaces, and cities are common to Yucatan, indicating that in former times a people of skill and advanced civilization occupied the region. They occur not only on the peninsula proper, but in the northern parts of Guatemala and Belize and on some of the islands. Within recent years several railroad lines have been built, and there is a steady growth in population and industrial wealth. Mérida is the chief railroad and manufacturing city and Campeche, on the Gulf of Campeachy, is the principal seaport. The peninsula has a population of 548,660.

YUCCA (yuk'ka), a genus of plants of the

lily family, having woody stems, lanceolate leaves, and a large panicle of showy, whitish, bell-shaped, drooping flowers. A number of species have been catalogued, all of which are native to the southern part of the United States, Mexico, and Central America. Most of the well-known species are cultivated as ornamental plants, especially the kind known as the common Adam's



THREE SPECIES OF YUCCA.

needle, which attains a height of eight to twelve feet in the native state, but is much smaller when cultivated in gardens. The stem and foliage are employed in Mexico for preparing a fiber useful in making cordage and the fruit, which is quite similar to small bananas, is consumed as an article of diet.

YUKON (yōō'kŏn), a river of North America, the most important waterway of Alaska. It rises in Yukon Territory, near Fort Selkirk (now Pelly), by two branches, the Pelly and the Lewes, flows toward the northwest to Fort Yukon, where it receives the Porcupine River, and assumes a general course toward the southwest, flowing into Bering Sea. The Yukon has a total length of 2,125 miles, is 20 miles wide in its lower course, and enters the sea by an extensive delta. Great deposits of silt have been made near its mouth, thus preventing the largest vessels from entering from the sea, but it is navigable for almost its entire course. The extreme

cold of winter prevents navigation the greater part of the year. Vast numbers of salmon swarm the river in the summer months and ascend fully 1,500 miles from the sea. The chief tributaries of the Yukon include the Koyukuk, Porcupine, Tanana, and Stewart rivers. It receives the discharge from Lake Teslin through the Hootalingua and the Lewes rivers. The Klondike is a noted tributary, joining the Yukon at Dawson, and is famous for its gold fields.

YUKON, a Territory of Canada, situated in the northwestern part of the Dominion. It is bounded on the north by the Arctic Ocean, east by Mackenzie, south by British Columbia, and west by Alaska. The southern boundary is formed by the 141st meridian of west longitude, which separates from Yukon a strip of land belonging to Alaska. Its extent from north to south is about 650 miles, from the Arctic Ocean on the north almost to the Pacific on the south. The area is 196,327 square miles.

Description. The surface is elevated and mountainous, and the altitude of the interior ranges from 2,000 to 3,000 feet. A coast range extends along the shore of the Arctic, and another range of highlands passes from southeast toward the northwest through the southwestern part of the Territory. The latter includes some of the highest summits in North America, such as Mount Logan, 19,539 feet, and Mount Saint Elias, 18,010 feet. Many of the loftiest summits rise considerably above the snow line, both in the north and in the southwest, and here is the

source of many glaciers. Valuable forests of

vast extent skirt the slopes and streams.

The drainage is chiefly by the Yukon and its tributaries. This great river has its source in the southwestern part and crosses the west central border into Alaska. It is formed by two headstreams, the Pelly and the Lewes rivers, at Pelly, whence it is navigable for boats to its mouth. Among the tributaries of the Yukon in the Territory are the Chandindu, the White, and the McQuesten rivers. The Porcupine River drains the northern part and joins the Yukon after passing into Alaska. A large region in the southwestern part is drained by the Kaskawulsh River through southern Alaska into the Pacific, and the southeastern part has a number of headstreams that flow through the Liard River into the Mackenzie.

The climate is marked by great extremes of temperature, ranging from 68° below zero in winter to about 85° above zero in summer. The long and cold winters are followed by short but pleasant summers. In the north are masses of ice covered by thick moss and here the ground never melts. However, the cold is somewhat mitigated by the dryness of the air. Ice closes the navigation of the Yukon River from the middle of September until the middle of May. Constant darkness prevails during the winter in the northern part, and daylight continues without intermission from the middle of May until

the early part of August. The rainfall is not heavy.

RESOURCES. The natural resources of Yukon are very extensive. While lumbering has not been developed extensively, the large forests of fir, cedar, pine, spruce, and poplar possess great commercial value. Fish and game are abundant and furnish the chief sustenance to the white hunters and to the Indians. Among the wild animals are the elk, bison, deer, musk ox, caribou, mountain sheep, ducks, geese, partridge, and prairie chicken.

The southern part has a large expanse of territory that is susceptible to cultivation. Here may be grown profitably the hardier crops, such as rye, barley, potatoes, cabbage, turnips, and peas. Many native grasses abound and grazing and dairying have been developed to some extent. The domesticated animals include cattle,

horses, dogs, and reindeer.

Yukon is especially rich in mineral resources. Gold is the principal product and the annual output averages about \$7,500,000. In the eleven years from 1896 to 1906 the total output of gold was \$112,864,363. Bituminous coal of a good quality is obtained, but the output is consumed locally. Copper mines are worked in the southern part. Other minerals include silver, platinum, asbestos, granite, limestone, and petroleum, but these are not worked to any extent.

Transportation. The Yukon River is the principal highway of commerce, but it is closed by ice from the middle of September until the middle of May. A railway extends into the southern part of the Territory from Skagway, in Alaska, with its terminus at White Horse. This line is 111 miles long and furnishes transportation between Lynn Canal, which is reached by vessels from the Pacific, to the Tahkeena River, a headstream of the Yukon. Canadian vessels are permitted to pass free throughout the entire length of the Yukon River. Telegraphic communication is maintained between Yukon and the leading cities of the Dominion.

GOVERNMENT. The Territory is administered by a commissioner, who is assisted by an executive council of ten members, five of whom are elected by the people. It is represented by one member in the Dominion House of Commons. Many missionary schools are maintained by religious denominations, and public instruction is provided in elementary and secondary schools under government support. The northwest mounted police, a force of constabulary, is instrumental in maintaining peace and enforcing the authority of the government of the Dominion.

INHABITANTS. The people who reside within the Territory consist largely of Eskimos and prospectors, but substantial business interests have been developed in the towns and the mining districts. Dawson, the center of the gold fields, is the capital and largest town. Other towns include White Horse, Pelly, Bonanza, and

Dominion. In 1901 the Territory had a population of 27,219; in 1911, 8,512.

HISTORY. The interior of Yukon was unknown until 1840. In that year Robert Campbell, a representative of the Hudson's Bay Company, explored the region to find a stream flowing westward to the Pacific. He followed the Pelly to its confluence with the Lewes, in 1843, and thus discovered the real source of the Yukon River. Fort Selkirk was soon afterward built at the junction of the two streams, but the town was afterward named Pelly. A large rush of prospectors and gold miners came into the region in 1908, when it was organized as a Territory of the Dominion. A public school system was inaugurated in 1901 and the following year representation was granted in the Parliament of the Dominion. Since that time there has been a constant growth in the development of its resources.

YUMA (yoo'ma), a city of Arizona, county seat of Yuma County, 250 miles southeast of Los Angeles, Cal. It is situated at the junction of the Gila and Colorado rivers and on the Southern Pacific Railroad. The surrounding country is agricultural, fruit growing, and mining. The features include the county courthouse, the high school, and several schools and churches. It has a large trade and good municipal improvements, such as electric lights, telephones, and waterworks. Population, 1910, 2,914.

YUMAS (yoo'maz), an Indian tribe of North America, which includes the Mohaves of Arizona. These Indians formerly occupied western Arizona and eastern California, but they are now confined principally to the region near the junction of the Gila and Colorado rivers. Fort Yuma, Cal., opposite from Yuma, Ariz., has long been a chief center of government supervision.

The Yumas are a small tribe.

3214

YVERDUN (ē-vâr-dôn'), or Yverdon, a city of Switzerland, in the canton of Vaud, at the southwestern end of Lake Neuchâtel. It is noted for its fine site among the scenic places of Switzerland. The palace, built by Duke Conrad of Zähringen in 1135, was the seat of the institute conducted by Pestalozzi from 1805 until 1825. Among the improvements are electric lighting, a museum of Roman antiquities, several fine promenades, and a gymnasium. It was fortified by the Romans, when it was noted for its trade and manufactures. Nearly all the inhabitants are French Protestants. Population, 1917, 8,045.



Z

ZAMBEZI

Z, the twenty-sixth and last letter of the English alphabet. It is a sibilant or hissing consonant and has the sound of the hard terminal s, as in dies, stands, multiplies. In the Phoenician, Greek, and Latin it was the seventh letter, but was dropped from the Latin in the 3d century B. C. It was restored in the 1st century B. C. to write Greek words, when it was placed at the end of the alphabet. The words in modern English which begin with z are all derived from other languages, principally from the Greek. It is the rarest English tone, representing less than three per cent. of the recognized sounds, and first came into use in 1688.

ZAANDAM (zän-däm'), or Saardam, a city of the Netherlands, in the Province of North Holland, six miles northwest of Amsterdam. It is at the junction of the Y and the Zann, the latter of which has been well canalized. Many of the buildings are of brick and are surrounded by well arranged gardens in which roses and tulips are plentiful. It is noted for its cleanliness and for being a typical place of the Netherlands. Among the industries are machine shops, lumber yards, iron works, and flouring mills. Peter the Great, in 1697, occupied a cabin in this place while he worked as a shipbuilder. Population, 1916, 24,166.

ZABRZE (zäbr'zhe), a city of Germany, in Silesia, 95 miles southeast of Breslau. It has extensive railroad and electric railway facilities. The noteworthy buildings include the city hall, the central railroad station, the high school, and a number of churches. It is in the center of one of the richest coal mining districts of Silesia, the works being operated by the state. Other industries include wire mills, coke ovens, machine shops, and brick and tile yards. The place owes its recent growth almost entirely to the mining and manufacturing interests. Population, 1915, 55,634.

ZACATECAS (sä-kà-tå'kàs), a city of Mexico, capital of the state of Zacatecas, 300 miles northwest of the city of Mexico. It has connections with other trade centers by railways and is surrounded by one of the most productive mining regions in the world. The silver veins in the vicinity were discovered by Juan de Tolosa, in 1546, and a thriving silver-mining camp

soon sprang up on its site. With the construction of railways and the development of its mineral resources the city grew into importance. It now has a number of public schools and churches, several hospitals and convents, and a considerable trade in farm produce and merchandise. Among the manufactures are ironware, utensils, tobacco products, clothing, and machinery. The place was incorporated as a city in 1585. Population, 1910, 25,905.

ZALINSKI (zà-lǐns'kê), Edmond Louis Gray, soldier, born in Kurnick, Germany, Dec. 13, 1849. He came to the United States in 1853, graduated from the schools of Syracuse, N. Y., in 1863, and soon after entered the Union Army. In 1864 he was placed on the staff of General Miles and for bravery at the Battle of Hatcher's Run, Virginia, was commissioned second lieutenant. He remained on General Miles's staff until the close of the war. In 1866 he was made second lieutenant in the regular army and was promoted captain in 1887. He was professor of military science at the Massachusetts Institute of Technology from 1872 to 1876. Besides being efficient as a soldier and teacher, he is known for his invention of an electrical fuse which has proven of great value in the pneumatic dynamite gun. He also invented a telescopic sight on artillery, an intrenching tool, and a ramrod bayonet.

ZAMBEZI (zam-ba'ze), a large river of South Africa, which ranks as the fourth in size of that continent. It rises near the southern boundary of the Congo Free State and, after a tortuous course of 1,650 miles toward the southeast, flows into the Mozambique Channel by an extensive delta. The upper course is generally toward the south, while the middle portion flows toward the northeast, and the lower course is toward the southeast. A short distance above Sesheke, at the eastern extremity of German Southwest Africa, is the Katema Molilo Rapids, and some distance below it is the celebrated Victoria Falls. This falls is 400 feet high and about 2,500 feet above sea level. The Zambezi basin includes 750,000 square miles, much of which is highly fertile and contains valuable forests. The Zambezi delta has an area of 25,000 square miles. Among its chief confluents is the Shire river,

which rises in Lake Nyassa and joins the Zambezi 90 miles above the sea. The Zambezi system furnishes about 4,000 miles of navigation, but as a whole it is comparatively unimportant for commercial purposes, since the stream and many of the tributaries are obstructed by falls

and rapids. See Victoria Falls.

ZANESVILLE (zānz'vĭl), a city in Ohio, county seat of Muskingum County, 52 miles east of Columbus, on the Ohio River and Western, the Baltimore and Ohio, the Cincinnati and Muskingum, and other railways. It is beautifully situated at the confluence of the Licking and the Muskingum rivers, is surrounded by a fertile farming region, and is connected with other trade centers by a number of electric railroads. The rivers are crossed by several fine bridges. Among the chief buildings are the county courthouse, the city hall, the high school, the Masonic Temple, the Clarendon Hotel, the Memorial Hall, the public library, and many churches. It has a large trade in farm produce, merchandise, and bituminous coal, which is mined in large quantities in the vicinity. The manufactured products include cotton and woolen goods, flour, paper, soap, chemicals, cigars, wire, hardware, steam engines, and machinery. It has large foundries and railroad machine shops. The streets are well improved by grading and paving. One of the first settlements in the Northwest Territory was made at Zanesville, in 1799, by Jonathan Zane, and it was the seat of the State Legislature from 1810 to 1812. Population, 1900, 23,538; in 1910, 28,026.

ZANGWILL (zăng'wil), Israel, novelist, born in London, England, in 1864. He descended from Jewish parents and attended the Jew's Free School in London. Several lecturing tours were made by him in Canada, the United States, Holland, and Palestine, and he met with success in writing novels and dramas in which Jewish scenes and characters are depicted. He has been influential as an advocate of Zionism and the settlement of Palestine by Jews. His celebrated play, "The Melting Pot," which proposes amalgamation as the solution of the Jewish problem in America, was presented with great success in the large cities. Among his general works are "The Big Bow Mystery," "They that Walk in Darkness," "Children of the Ghetto," "The Moment of Death," "Merely Mary Ann," "The Serio-Comic Governess," and "The Mantle of Elijah."

Elijah."

ZANTE (zän'tê), one of the largest islands of the Ionian group, situated nine miles west of the Peloponnesus. It has an area of 277 square miles. The island is of volcanic origin, but has fertile soil. The climate is pleasant and healthful. Oranges, olives, melons, citrons, and currants are the chief products. It has manufactures of wine, carpets, cotton and linen goods, gold ornaments, and clothing. The wine and currants of Zante are widely known. Anciently the island was known as Bacynthus and was long

an independent state. In 1864 it was annexed to Greece along with the Ionian isles. Zante is the capital and largest city. Population, 1918, 46,380.

ZANZIBAR (zän-zĭ-bär'), a British protectorate in Africa, lying east of German East Africa. It includes the islands of Zanzibar and Pemba, off the eastern shore. The island of Zanzibar has an area of 625 square miles. It contains the city of Zanzibar, which is the chief town and seat of local government and has an estimated population of 100,000, thus being the largest city on the eastern coast of Africa. Pemba has an area of 360 square miles. Both these islands have fertile soil and good harbors. They produce cloves, hides, ivory, copra, shells, cotton, indigo, rice, fruits, and vegetables. Domestic animals, such as horses and cattle, are reared successfully. A small strip of the mainland was formerly claimed by Great Britain, but it is now included in German East Africa. Great Britain, Germany, and France have the larger part of the export and import trade. A railway is in operation from the city of Zanzibar to the plantations in the northern part of the island, a distance of seven miles. Natives known as They are Swahillis form the laboring class. peaceable, loyal to the government, and apt in learning civilized arts. Other inhabitants include Arabs, Germans, English, Portuguese, French, Hindus, and Italians. Most of the people are Mohammedans, but many Christian missions are maintained. Slavery in a modified form still exists, though the laboring classes have their own houses and cannot be separated from their wives and families. The entire population is estimated at 250,000.

ZEALAND or Zeeland (ze'land), the largest island of Denmark. It is separated from Sweden by The Sound and from the island of Fyen by the Great Belt. The shores are indented by numerous inlets, thus reducing the land area to 2,638 square miles. Farming and dairying are the chief industries, but it has considerable interests in stock raising, fishing, and manufacturing. The chief manufactures include woolen and linen goods, leather, dairy products, salt, clothing, machinery, and sailing vessels. Copenhagen is the capital of Zealand and of Denmark. Other important cities include Roeskilde, Elsinore, and Slagelse. Population, 1908, including the islets of Amager and Möen, 1,103,-602.

ZEBRA (ze'bra), an animal resembling the horse, but which has external characteristics found in the ass. It resembles the latter in having no warts on the legs, in the tail being covered with long hairs only toward the extremity, and in the full and arched neck having an erect and stiff mane. Several species have been enumerated, all of which are more or less striped. The height is about four and a half feet at the shoulder and the form is light and graceful. The general color is a yellowish-white, with

black stripes on the neck, limbs, and body. Zebras have ears rather longer than those of the horse and the senses of hearing, smell, and sight are well developed. They are shy animals and on the least alarm gallop to a place of safety.

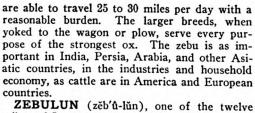


MOUNTAIN ZEBRA.

When attacked by an enemy, they defend themselves by forming a compact body and beating with their heels. In this way they are able to pro-

tect themselves successfully against the leopard and lion. Zebras were formerly found throughout the region of Africa lying south of the Equator, but their number is diminishing quite rapidly. The true zebra, or mountain zebra, of the mountainous parts of Cape Colony is nearly exterminated. It is more barred than Burchell's zebra, found in herds on the plains of South Africa. Other species inhabit the country south of Abyssinia and Somaliland. The natives prize the flesh of the zebra and use these animals as beasts of burden in the domesticated state.

ZEBÜ (thā-voo'). See Cebii; Philippines. ZEBU (ze'bū), a class of animals of the ox family, which are reared extensively in the region from Japan to East Africa, but they atttain

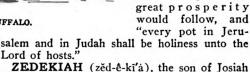


tribes of Israel, whose country lay in the fertile valleys and hills north of the plain of Jezreel, extending from the Lake of Gennesaret to the Mediterranean. We learn from Genesis xxx., 20, that the Zebulunites descended from the sixth son of Jacob and Leah. They were noted for their skill in commercial enterprises and warlike spirit. In their prosperous times they had a profitable trade from their ports on the Mediterranean with the Phoenicians.

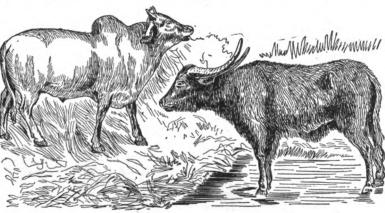
ZECHARIAH (zěch-à-rī'à), or Zachariah, an eminent prophet of the ancient Hebrews, son of Berechiah, the son of Iddo. He was born in Bablyon at the time of the captivity and accompanied the exiles led by Jeshua and Zerubbabel to Palestine, where he developed much influence among his countrymen and was elevated to the offices of priest and prophet. His name is attached to the eleventh in order of the twelve minor prophetic books, and his prophecies are devoted largely to the glory that shall come to Jerusalem after the rebuilding of the temple. The book assigned to him is the largest of those written by the minor prophets. He predicted

that both Phoenicia and Damascus would be brought to ruin, but pictured a brighter future for Judah than would fall to the share of Javan (Greece). According to his prophecies the Hebrew people were to pass through a time that would test their courage and perseverance, but, when the good times returned, a period of great prosperity would follow, and





by his wife, Hamutal, and the last king of Judah. He succeeded his nephew, Jehoiachin. The Chaldeaens captured him at the siege of Jerusalem, in 588 B. C., and conveyed him to Babylon, after slaying his sons and depriving him of his eyesight. He died in captivity and with him the kingdom of David and Solomon ended.



ZEBU.

BUFFALO.

the greatest perfection in India. Many species have been originated by breeding, varying much in size, strength, and color. They differ from the cattle reared in Canada and the United States mainly because of their drooping ears and convex forehead, and in having a fatty hump on the withers, which in the larger breeds weighs 40 to 50 pounds. Zebus are docile and gentle animals. In general they are reared for their milk and flesh, but are used quite extensively as beasts of burden and draught. They

ZEISBERGER (zīs'bērg-ēr), David, missionary, born in Zauchtenthal, Austria, April 11, 1721; died in Goshen, Ohio, Nov. 17, 1808. He descended from German-Moravian parents and in 1740 came to America, settling in Georgia. Later he proceeded to Bethlehem, Pa., where he took part in establishing the Moravian colony and studied the Indian languages. In 1743 he took up missionary work among the Delawares and Onondagas, converting many of them to Christianity. His labors were interrupted at the outbreak of the French and Indian War, but he continued active as a religious worker, and in 1771 established a mission on the Muskingum River, Ohio. This settlement was broken up by the Wyandots and he labored for some time in the missionary field of Canada, but returned to Ohio in 1798 and founded Goshen. Zeisberger was not only master of several Indian languages, but wrote many valuable works, including Indian-English grammars, spelling books, and dictionaries. Among the more important of his writings are "German and Onondaga Lexicon," "Sermons for Children," "Delaware and English Spelling Book," "Dictionary in German and Delaware," and "Collection of Hymns for Christian Indians.'

ZELAYA (se-la'ya), José Santos, soldier and statesman, born in Managua, Nicaragua, in 1845. He studied in his native town and soon after joined the army. In 1885 he was made general for valued services, and became the recognized head of the liberal party. He was a leader in the revolution of 1893, when a new constitution was adopted and he was made president of the republic of Nicaragua. His administration was liberal. He extended the influence of the government, promoted education, and fostered commercial expansion. In the agitation for a union of the republics of Central America, Zelaya was a recognized leader.

ZELLER (tsĕl'lĕr), Eduard, theologian and philosopher, born in Kleinbottwar, Germany, Jan. 22, 1814; died March 19, 1908. He studied at Tübingen and Berlin and became a teacher of theology at the former institution in 1840. In 1847 he accepted the chair of theology at the University of Berne and later taught at Marburg, Heidelberg, and Berlin. He was one of the founders of the Theologische Jahrbücher, in which he published much in support of the philosophical and historical methods of Bauer, Strauss, and Hegel. His chief writings include "Philosophy of the Greeks," "The Theological System of Zwingli," "The State and the Church," "Frederick the Great as a Philosopher," and "The History of Philosophy since Leibniz."

ZEMSTVO (zemst'vo), the chief political body in the government of a province in Russia. The members are chosen by the suffrage of the three classes known as landed proprietors, peasants, and householders of the town. It is presided over by the president, or governor, of the province and has general administrative power within its jurisdiction. This body elects an upraba, whose duty is to see that the regulations of the zemstvo are enforced.

ZENANA (zê-na'na), the name of a dwelling used by a high caste family of India, in which the women and girls have their quarters. A typical dwelling of this kind is in two parts, each built around its own court, and the one nearest the street is occupied by the men. The zenana is in the rear building, usually on the second floor, while the first floor is occupied by the kitchen and in part is used for storage. The poorer buildings of this class are so constructed that milch cows and other domestic animals occupy a part of the first floor.

ZEND-AVESTA (zēnd'a-vĕs'ta). See Avesta.

ZENGER, John Peter, publisher, born in Germany, in 1680; died in 1746. He emigrated to America in 1700 and took up his residence in New York City, where he established himself in the printing and publishing business. In 1733 he founded the New York Weekly Journal, which he made an important factor in the government. His attacks upon some of the practices engaged in by public men caused him to be arrested on a charge of libel. Andrew Hamilton, an eminent barrister from Philadelphia, was employed to defend him before the jury, and a verdict of not guilty was the result. The questions decided in this trial established a precedent in furthering the freedom of the press in America.

ZENITH (ze'nith), the point in the heavens which is precisely over the head of the observer. The point directly opposite under the feet of the observer is called the *nadir*. These terms are employed in astronomy. A plumb line suspended from the zenith would pierce space so as to rest upon or directly above the nadir.

ZENO (ze'no), famous Greek philosopher, founder of the Stoics, born at Citium in Cyprus about 350; died about 258 B. c. He was the son of a merchant and, after losing his fortune in a shipwreck, adopted the Cynic doctrines, a form of belief that holds riches in contempt. To fit himself for teaching, he studied twenty years under various masters and then established a school and developed a system of philosophy. His followers became known as Stoics from the Painted Porch, which he selected as the place for meeting his pupils. Zeno was a contemporary of Epicurus, the founder of the Epicureans, and Pericles was among his noted pupils. The doctrines taught by him inculcated simplicity and energy, led the student to a life of patience and fortitude, and developed nobility of charac-Many ancients embraced the doctrines taught by Zeno, and both Greeks and Romans honored him in paintings and sculptures. Only a few fragments of his writings are extant.

ZENO, Emperor of the Eastern Empire from 474 to 491, the husband of Ariadne, daughter of Leo I. He became patrician in 468 and was soon after made commander of the imperial

guard of the armies of the East. His reign was largely disturbed by wars, not only by the invading Goths, but the people of Constantinople opposed him because he was of foreign birth. His government was cruel and oppressive and he gave himself up to pleasure, leaving the administration of public affairs to Illus, his sole consul and minister. He was succeeded by Anastasius.

ZENOBIA

ZENOBIA (zĕ-nō'bĭ-à), Septimia, Queen of Palmyra and wife of King Odenathus. She was the daughter of an Arab chief and became noted for her learning in Greek, Latin, Syriac, Egyptian, and other languages. After the death of her first husband she married Odenathus, prince of Palmyra, who was highly successful in the Persian wars. She was as courageous as learned and accompanied her husband as an adviser and assistant to the East. After the death of her husband, in 266 A. D., she succeeded to the throne, assuming the title of Queen of the East. It was her ambition to annex Asia Minor, Syria, and Egypt, but the Romans under Emperor Aurelian defeated her in two battles in 270 and besieged her at Palmyra. After a brave defense, she attempted to escape from the city, but was taken captive and carried to Rome, where she was made to grace the triumph of Aurelian. The latter presented her with large possessions near Tivoli, where she lived in comfort and luxury until her death. Zenobia ranks with Cleopatra in her talents and personal traits, but possessed purity of character and a greater degree of prudence. Her son, Vahballathus, by her first husband was given a principality in Armenia.

ZEPHANIAH (zĕf-à-nī'à), the ninth in order of the twelve minor Hebrew prophets, who prophesied in the reign of King Josiah, from 630 to 624 B. C. According to the account he descended in the fourth generation from a man by the name of Hezekiah, which is supposed to have reference to the King of Judah. His prophecy is divided into three chapters. The first is a warning against Judah and the Philistines, in the second he foretells the fall of Nineveh, and in the last he predicts salvation and a blissful future for those who are purified in the fear of God. Although the first two chapters are written in a somber tone, he gives evidence in the last of mastery of style and ability to use language forcibly.

ZEPPELIN, Ferdinand, soldier and aëronaut, born in Constance, Germany, July 8, 1838. He studied at the Polytechnic School in Stuttgart and in a military school at Ludwigsburg. In 1858 he became an officer in the army. He took part in the Seven Weeks' War and the Franco-German War, in both of which he rendered valuable service. Subsequently he began to study airships with a view of producing devices which would be of value in military engagements. He established a works at Friedrichshafen, on Lake Constance, where he

produced a large number of dirigible balloons. It may be said that he developed this type of aëronautic machines and was the first to employ engines of considerable power to propel them.

In 1908 he made a memorable flight of about 800 miles, with a maximum speed of 40 miles per hour, but his airship was wrecked by a storm after / the successful experiment. A popular subscription was immediately taken



COUNT VON ZEPPELIN.

to rebuild this airship. Up to 1910 he was the most successful aëronaut in constructing and sailing with the dirigible balloon. The Reichstag appropriated \$537,500 to purchase two of his airships and presented him with a fund of \$100,000 in recognition of his service

to science. He died March 8, 1917.

ZERO (zē'rō), in physics, the term applied to the point in time or space which constitutes the base or origin of measurement. Originally the zero point in thermometers was fixed at the normal temperature of the human body, and later the fundamental point was based upon the temperature of spring water. Fahrenheit fixed the zero in his thermometer by the temperature obtained from mixing salt and ice, while the freezing point of ice was made the zero by Réaumur. In the Centigrade thermometer the freezing point is zero and the boiling point is 100°. In mathematics, the zero is a symbol written O, signifying the absence of number or quantity. It is used in the same way as a symbol to signify an infinitesimal quantity. In algebra the positive numbers proceed to infinity in one direction from O, and the negative numbers proceed from it to infinity in the opposite direction.

ZEUS (zūs), the chief deity of the Greeks, who was regarded by them as the ruler of heaven and earth. He was represented as the son of Cronus and Rhea, the brother of Poseidon and Hera, and sometimes as the husband of the last mentioned. The ancient Greek writings mention him as god of all aërial phenomena, as the personification of the laws of nature, as lord of the state, and as the father of gods and men. After expelling his father and the Titans from the throne, he assumed absolute control, but appointed Poseidon as god of the sea and gave Hades control of the infernal regions. With these two personages he had joint control of the earth. The

top of Mount Olympus, a lofty mountain between Thessaly and Macedon, was believed to be the home of Zeus, where he was supposed to be hidden from mortal view by the clouds



and mist. He was worshiped at various places, but chiefly at Dodona, Crete, and Arcadia, and the oak tree and the summits of mountains were sacred to him. In statuary he was represented as accompanied by an eagle, perhaps from the circumstance that this bird is capable of gazing at the sun, thus suggesting the idea that it was able to the contemplate splendor of divine

3220

majesty. Zeus was afterward identified with the Ammon of Libya and the Jupiter of the Romans. His seven immortal wives were Hera, Leto, Metis, Themis, Demeter, Eurynome,

and Mnemosyne. See Jupiter.

ZEUXIS (zūks'is), a painter of ancient Greece, who flourished near the end of the 5th century B. C. It is thought that he was born in Heraclea, on the Euxine, about 450 B. C., but nothing is certain as to the dates of his birth or death. The greater part of his life appears to have been spent at Ephesus, and he seems to have visited Athens and the southern part of Italy. Mention is made of him by Cicero, Lucian, and Pliny. His chief paintings include "Helen," "Alcmena," "Zeus Surrounded by the Gods," and "Hercules Strangling the Serpent.' ZHITOMIR (zhǐ-tà-mēr'). See Jitomir.

ZIETHEN (tsē'ten), Hans Joachim von, famous military leader, born in Brandenburg, Germany, May 18, 1699; died in Berlin, Jan. 26, 1786. He obtained a careful military education and in 1726 became lieutenant of dragoons in the army of Prussia. In 1735 he served with eminent success in the campaign against France, as colonel of a regiment of hussars, and in the Silesian War distinguished himself at Hohenfriedberg, Hennersdorf, and Jägerndorf. His services were of value throughout the Seven Years' War. Frederick the Great decorated him with a number of medals and bestowed upon him large landed interests. On the Ziethenplatz, in Berlin, is a fine monument erected to his honor.

ZILLEH (zā'lě), or Zileh, an ancient town of Asiatic Turkey, formerly called Zela, 28 miles southwest of Tokat. It occupies an eminence overlooking the surrounding country and in former times was the seat of beautiful temples and vast fortifications, but now only ruins remain of the ancient structures. Zilleh was the scene of a battle between Julius Caesar and the Pharnaces. It was in regard to this engagement that the former sent his famous report, "I came, I saw, I conquered." The town now has manufactures of cotton and woolen goods, utensils, earthenware, and turbans. It is ruled by the chief officer of the vilayet of Sivas. The inhabitants consist chiefly of Turks. Population, 1906, 21,450.

ZIMMERMANN (zim'mēr-man), Johann Georg von, eminent physician and author, born in Brugg, Switzerland, Dec. 8, 1728; died in Hanover, Germany, Oct. 7, 1795. He studied in his native town and Berne, and afterward took a course in medicine at the University of Göttingen. In 1751 he obtained the doctor's degree, at which time he delivered an address on "Irritability." He practiced medicine in Brugg and Berne and in the meantime devoted himself to literary work. His success in the practice of medicine attracted attention throughout Europe and in 1796 he was called to Potsdam by Frederick the Great, who was then in his last illness. His writings include "On Solitude," "National Pride," "Experience in Medicine," and "Bi-

ography of Frederick the Great.'

ZINC (zink), or Spelter, a bluish-white metal which is capable of taking a high luster. It occurs in combination with other metals and is found native in small quantities. When heated to redness in the air, it takes fire and burns with a bluish flame, giving off clouds of white zinc oxide. Sulphuric and nitric acids dissolve it. It is brittle at ordinary temperatures, but commercial zinc may be hammered into sheets or drawn into wire when heated to 212°. Dry air does not alter its lustrous surface, but in moist air it becomes dull from the formation of a film of hydrated carbonate which protects the metal from further action. Zinc was known as a component of brass long before it was discovered as an individual metal. The ores from which it is obtained are the carbonate, which is called smithsonite, and the sulphide called blende. These minerals are broken up and roasted in furnaces resembling limekilns to extract from them the zinc.

Zinc has many uses in the arts, as in the manufacture of brass for roofing and as the positive element in batteries. The property of forming a film or crust when exposed to moist air, thus keeping it from rusting, makes it valuable in the construction of water spouts, bath tubs, and tanks, and for covering iron cables and sheets to keep them from rusting. Articles covered in this way with a coat of zinc are said to be galvanized, though the term is not strictly proper, for the reason that electricity is not employed in the process, but the coating is put on in the way that tin is applied to iron plates when making sheet tin. Besides brass, other alloys, as bronze and German silver, contain a considerable quantity of zinc. It is of much value in the printers' art in that it is employed in making zinc etchings, which have taken the place of wood cuts and steel engravings in many printing offices, and is used for molds in casting artistic works, such as ornaments and statues. The production of zinc in the United States aggregates annually about 225,250 tons and represents a value of \$20,000,000. Among the productive zinc fields are those of Missouri, Kansas, New Jersey, Iowa, Wisconsin, Virginia, and other states. Productive zinc mines are worked in Ontario, British Columbia, and other provinces of Canada. The chief productions in European countries are in Spain, Germany, England, and Austria. Much of the American product is exported. The value of zinc per ton ranges usually from \$25 to \$45.

ZINC ETCHING, a method of preparing plates for printing from designs made by hand or otherwise, such as a drawing or lettering. The design is made in black ink on white paper or cardboard, or it may consist of a print from type. The drawing or print is photographed and the photograph is reversed on a sensitized plate, after which the negative is developed on a zinc plate. This plate is prepared by etching, which is done by covering the surface with a thin coat or ground that is not affected by acid. The design is traced with a sharp tool so as to lay the metal bare where it touches, after which diluted acid is poured over the surface. This acid bites or corrodes on the lines made through the ground. The acid is removed after the etching is sufficiently deep to render the desired contrast between the light and dark shades. When thoroughly cleaned, it is nailed to a wooden block so as to make it type-high. Etchings of this kind may be small, as the illustrations used in books, or they may constitute an entire column or even a page for printing. Fine shading cannot be reproduced by this process, as with half-tone plates and engravings, but it is convenient and inexpensive, hence is employed extensively in preparing illustrations for peri-

ZINC WHITE, a product used extensively for making white paint. It was formerly made by burning pure zinc and collecting the fumes, but is now obtained by a process which combines the burning of the zinc and the collecting of the vapors in the same apparatus. The method in common use consists of placing a mixture of anthracite coal and zinc upon a perforated hearth, below which is a closed ash pit. After the coal has been kindled, a blast of air is forced through the ash pit. This causes the zinc to rise in the form of fumes, but the products of combustion contain an excess of air with vapor of metallic zinc, and they undergo another combustion after leaving the charge. This final combustion causes the formation of fumes of zinc oxide, which are caught, after cooling, by being forced through bags of some

textile fabric. The finished product is a white powder, which is mixed or ground with linseed oil. In this form it is used extensively as a substitute for white lead in painting woodwork, but it is less valuable for exteriors, since it is more easily injured by the weather.

ZINZENDORF (tsĭn'tsen-dôrf), Nicholas Lewis, Count, noted bishop, born in Dresden, Germany, May 26, 1700; died in Herrnhut, May

9, 1760. His father was a minister in Saxony, where he held an official position, but died when the son was quite young. The latter studied in Halle and Wittenberg, where he took courses in science, literature, and theology. He left



COUNT ZINZENDORF.

Wittenberg in 1719 to travel in Holland and France, and subsequently published "Pilgrimage of Atticus Through the World." In 1722 he married Countess Reuss von Ebersdorf and soon after established a settlement on his estate for Protestant refugees, naming it Herrnhut. At that place John Wesley secured his religious enthusiasm and formulated plans to conduct missionary work in America. In 1739 Count Zinzendorf visited the missionary fields of the West Indies, came to New York in 1741, and soon after went to Pennsylvania, where he visited the Moravian colony and founded Bethlehem. He published many hymns and sermons.

ZION CITY, a city of Lake County, Ill., 30 miles north of Chicago, on Lake Michigan and on the Northwestern Railroad. It has manufactures of lace, soap, and utensils. The chief buildings include the city hall, the Christian Catholic Tabernacle, and several hospices. It was founded by John Alexander Dowie in 1900 and incorporated in 1902. Pop., 1910, 4,789.

ZION (zī'ŏn), Mount, an eminence in Jerusalem, forming the southwest part of that city. The portion of the city built on Mount Zion was formerly called the City of David, owing to its containing the citadel of David. It was entirely within the walls of the ancient city, but at present only the north half is included, the wall running over the hill in an oblique direction. Mount Zion is 2,525 feet above sea level. Toward the southwest it descends quite abruptly into the vale of Hinnom. Many of the Old Testament writers speak of Jerusalem as the Zion, and frequently refer to it as the Daughter of Zion. It is supposed to be the Salem associated with Melchisedek, who is spoken of in Genesis xiv., 18.

ZIONISTS, the name applied to a large or-

3222

ZIRCONIUM

ganization among the Jewish people of the world, whose ultimate object is to centralize influences with the view of founding a Jewish nation. While some have proposed the colonization of new countries, as portions of South America, the general inclination is to favor emigration to Palestine, where they hope to redeem the city of David and once more rear a vast temple for the worship of Jehovah. Those who are not so hopeful as to believe it possible to develop a powerful Jewish state by emigrating to Jerusalem still favor the plan for the reason that it would be the means of isolating themselves, thereby making it possible to observe Saturday, their Sabbath, more successfully than is possible while living among Christian nations. However, the enterprise of conducting a large emigration of Jews into Syria is opposed strenuously by the Sultan of Turkey, who has fears lest such colonization would prove harmful to the interests of the Turks and Mohammedans.

The latest estimates place the Jewish population of the world at 11,800,000. If all these people could be brought together in some land having favorable climatic conditions and an abundance of natural resources, it would seem that their hopes of building an independent nation could be realized. This is made even more feasible when it is considered that collectively these people are in possession of vast wealth and progressive intelligence, and that they include doctors, teachers, artisans, traders, agri-culturists, and laborers. However, it is doubtful whether the rich would be willing to leave the country in which they now enjoy abundance and equal political rights with others, and whether the poor would be able to defray the expenses of transportation to the country selected for settlement.

Several examples of successful experiments in Jewish colonization may be cited. For instance, the Jewish Colonization Association purchased 325,000 acres of arable land in Argentina, where about 15,000 Jewish settlers founded homes in the period between 1898 and 1918. The Zionists held a general congress in London, England, in 1900, at which 500 delegates attend-They represented several thousand Zionist societies and came from all countries in the world. This congress was one of many successful meetings held both before and since, all of which have operated to cement the bond of sympathy existing among the representatives coming from different countries. Among the Jews are many who think that they should seek an enlargement of their influence in each country instead of venturing on an enterprise so vast as the building of an independent state.

ZIRCONIUM (zer-ko'ni-um), a rare metal discovered by Klaproth in 1789, so named from being found principally in the mineral called zirzon. The latter is a silicate of zirconium and occurs in various parts of Ceylon, Norway, and Ireland. Berzelius first obtained zirconium in the isolated state in 1824. It is gray, solid, somewhat brittle and combines with oxygen to form a dioxide, which is a white tasteless powder. Zirconium is used in various forms with other metals to construct the mantle of the Welsbach gas burner, by which a bright colorless flame is obtained.

ZISKA (zĭs'ka), or Zizka, John, famous Hussite leader, born near the castle of Trocsznov, Bohemia, about 1360; died at the castle of Przibislav, Oct. 12, 1424. He descended from a noble family and became a page to King Wenceslas of Bohemia, but afterward joined the military service against the Teutonic Knights. In the decisive Battle of Grünwald, near Tannenberg, Germany, he fought on the losing side, but was highly rewarded by the king for great bravery. He was an adherent of the Hussite doctrine and, after the murder of John Huss, became eminent as an active advocate of the new faith. In 1419 he was chosen as leader of the Hussites, largely because of his gallantry in the Hungarian wars against the Turks, and, when Emperor Sigismund attempted to obtain the throne of Bohemia, Ziska made a stubborn resistance. It soon became apparent that the conquest of Bohemia could not be accomplished, hence Sigismund proposed a treaty by which Ziska should succeed King Wenceslas as governor of Bohemia, that sovereign having died while the conflict was raging. However, he died before the treaty was concluded and was buried at Czaslav.

ZITHER (zĭth'er), a musical instrument used extensively among the Germans of the Alps in Europe, so named from the word zither, meaning to shiver. It is the modern successor of the ancient cithara of the Greeks and is supposed to be identical with the psaltery mentioned in the Bible. The form is that of a flat stringed instrument, with a shallow resonance box, and is fitted with two sound holes and 32 or more strings. The strings consist of five melody, twelve accompaniment, and thirteen bass strings, made partly of metal and partly of gut and silk. In playing this instrument, it is placed on the knees or on a table, and the thumbs of both hands as well as the first, second, and third fingers are used. A partially open ring, used to strike the melody strings, is worn on the thumb of the right hand and takes the place of the bow used in playing the violin. The zither is very popular in the Tyrol and in Austria.

ZITTAU (tsit'tou), a city of Germany, in Saxony, fifty miles southeast of Dresden, with which it is connected by railway. It occupies a fine site on the Mandau River and is populated almost entirely by Protestants. The chief buildings include the Byzantine Church of Saint John, a fine courthouse, the public library of 40,000 volumes, and several secondary schools. Among the manufactures are paper, machinery, bicycles, cotton and woolen goods, earthenware, and dyestuffs. It carries a large trade in bituminous

coal, which is mined in the vicinity. Population, 1905, 34,719; in 1910, 37,084.

ZITTEL, Karl Alfred, geologist, born at Bahlingen, Germany, in 1839; died Jan. 6, 1904. He studied in Paris and Heidelberg and became professor of geology at the University of Vienna, in 1863. In the same year he was chosen professor of mineralogy at the Karlsruhe Polytechnic School, was appointed to the chair of paleontology at Munich in 1866, and accompanied the expedition under Rohlf to Egypt in 1873. Subsequently, in 1899, he became president of the Bavarian Academy of Science. His publications include "Handbook of Paleontology," "The Sahara," "History of Our Knowledge of Paleontology at the End of the Nineteenth Century," and "Geology and Paleontology of the Libyan Desert."

ZODIAC (zo'dĭ-ăk), an imaginary belt encir-Lling the heavens, extending about 8° on each side of the ecliptic, 16° in width, and containing the paths of the moon and planets. It is impossible for the moon and the larger planets ever to travel outside this belt. Early astronomers divided it into twelve parts, called constellations, and designated them by certain arbitrary signs, termed signs of the zodiac. The signs indicate equal parts of 30° each, which 2,000 years ago corresponded to twelve constellations bearing the same names. Now each constellation is in the sign that has the name next following that of the constellation, this being due to the precession of the equinoxes. The signs of the zodiac, as they appear at present in relation to the seasons of the year, are as follows:

The ancients named the signs from the constellations in the following order: Aries, the Ram; Taurus, the Bull; Gemini, the Twins; Cancer, the Crab; Leo, the Lion; Virgo, the Virgin; Libra, the Balance; Scorpio, the Scorpion; Sagittarius, the Archer; Capricornus, the Goat; Aquarius, the Water Bearer; and Pisces, the Fishes. These names were derived from the fanciful similarity between the supposed configuration of the stars and the objects designated. When Hipparchus observed the constellations at Rhodes, about 150 B. C., they coincided with the signs of the zodiac named above, but the precession of the equinoxes in space has caused them to fall back, or westward, about 30°, hence the sun enters Pisces on March 20 instead of Aries as formerly. The revolution will be complete in a period of about 25,868 years from the time observations were made by Hipparchus, when the sign and constellation of Aries will again coincide.

ZODIACAL LIGHT (zô-dī'á-kal), a faint light frequently seen after sunset on clear even-

ings in the winter and spring, and before daybreak from September until January. It is triangular in appearance, its base being on the horizon, and its greatest length extending along the path of the sun. In our latitude it is seen most clearly on favorable evenings of winter and spring on the western horizon, when it extends back along the path of the sun, but within the tropics it sometimes rivals the Milky Way. The light should be looked for from a half hour to an hour before sunrise or after sunset. Theories differ as to the origin of the zodiacal light, but the one most probably true is that it is composed of an immense number of meteroids, reflecting the sunlight, and which are so small that their united luster is barely distinguishable.

ZOLA (zō'là), Émile, eminent novelist, born in Paris, France, April 2, 1840; died Sept. 29, 1902. He studied at the Lycée Saint Louis, en-

gaged in a book publishing establishment, and contributed to the Figaro, The Voltaire, and other periodicals. In order to come in touch with the numerous phases of life in Paris, he visited the huts and hovels of the poorer classes. This caused him to become a powerful delineator of character and a close student of condi-



ÉMILE ZOLA.

tions. Soon after he became recognized as an efficient novelist. On several occasions he followed the example of Eugene Sue by putting on ragged clothes and visiting the slums to view the scenes of crime, thus enabling him to depict them with remarkable realism. He was made a chevalier of the Legion of Honor in 1891, and two years later visited London at the invitation of the London Institute of Journalists. In 1895 he visited Rome and in the same year published his "Rome," which contains a vivid description of the court maintained by the Pope. He attracted general attention in 1898 by publishing a letter in which he asserted that the general staff of the army had conducted a partial trial in the case of Captain Alfred Dreyfus. For this he was brought to trial and a verdict was rendered against him, but the whole affair ended in finally obtaining justice for the officer in whose defense he had written. His chief writings include "La Confession de Claude," "Les Mystires de Marseilles," "An Bonheur des Dames," "La Docteur Pascal," and "Contes à Ninon."

ZOLLICOFFER, Felix Kirk, soldier, born in Maury County, Tenn., May 19, 1812; died Jan. 19, 1862. His grandfather, George Zollicoffer, came from Switzerland and served as captain in the Revolutionary War. He attended the public schools, became a printer, and established a newspaper at Paris, Tenn. Later he published periodicals in Alabama, but took part in the Seminole War of 1837. Subsequently he

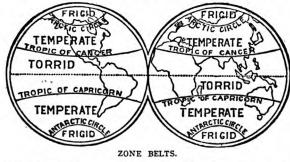
3224

became identified as a leader in the Whig party, was elected State senator in 1849, and after 1853 served three terms in Congress, where he gained a reputation as a debater. In 1861 he was a delegate to the peace conference, but joined the Confederate service in the same year, with the rank of brigadier general. He commanded a force of 2,000 at Mill Springs, Ky., where he was attacked by the Federals under General Thomas. In the meantime he was succeeded in command by General Crittenden. While inspecting the position of the enemy, after having ordered an advance, he was mortally wounded.

ZÖLLNER (tsel'ner), Heinrich, composer, born at Leipsic, Germany, in 1854. After studying law, he pursued courses in music at the Conservatory of Leipsic and in 1878 was musical director at Dorpat. He promoted several musical associations and in 1889 toured France and Italy with a number of associates. In 1890 he conducted popular concerts in New York and other cities of the United States, and subsequently returned to Leipsic as musical director at the university. He is the author of several musical productions. His works embrace the cantata entitled "The New World," the oratorio "Luther,' and the operas "Faust," "At Sedan," "Frithjof,' and "In the Year 1870."

ZOLLVEREIN (tsől'fe-rīn), a customs union established in 1818 by the German states for fiscal purposes under the leadership of Prus-It was organized to equalize tariff rates and to overcome the inconveniences caused by the collection of tariffs when making transportations of products either among the different states or receiving imports from foreign countries. This commercial union paved the way to political consolidation and the establishment of the present empire. At the formation of the new empire, in 1871, several free cities were not included, but the free ports were brought into the union in 1888. In this way the original zollverein was superseded by the imperial customs and the freedom of trade became established between the different states and cities.

ZONE, in geography, a region of the earth inclosed between two parallels of latitude. The



term is applied specially to one of the five divisions of the earth's surface, which take their names from the prevailing climate. They are the North Frigid Zone, North Temperate Zone, Torrid Zone, South Temperate Zone, and South Frigid Zone. Since the axis of the earth is inclined 231/2° to the plane of the ecliptic, the Arctic Circle and the Antarctic Circle are located 231/2° respectively from the North and South poles, and the tropics of Cancer and Capricorn are situated respectively that distance north and south of the Equator. The region lying within the Arctic Circle is called the North Frigid Zone, and the region within the Antarctic Circle is designated the South Frigid Zone. The Torrid Zone is between the tropics of Cancer and Capricorn; the North Temperate Zone, between the Arctic Circle and the Tropic of Cancer; and the South Temperate Zone, between the Antartic Circle and the Tropic of Capricorn. Hence, measured from pole to pole, the Frigid zones have each a width of 231/2° the Temperate zones, each a width of 43°; and the Torrid Zone, 47°, making a total of 180°. In the illustration is shown the zone belts of the earth, together with the location of the land masses and oceans. The term zone is applied in natural history to well-defined belts within which certain forms of animal or plant life are confined, as found in ascending mountains. It applies in ordinary use to a belt of land distinguished by similar characteristics, as the corn zone, cotton zone, free-trade zone, etc.

ZOÖLOGICAL GARDEN (zō-ō-lŏj'i-kal), an inclosure maintained for the development and study of animal life, usually in connection with a public park. The first establishment of this kind was planned by Jardin des Plantes in Paris, France, where a fine garden of this kind was founded in 1804. This institution was soon succeeded by other gardens of a similar kind in the leading countries of the world, but especially in Europe and America. The finest zoölogical gardens maintained at present are in Germany and the one at Berlin is the most extensive establishment of the kind in the world, both in the buildings and the collections of animals. Other celebrated gardens of this kind are maintained in Vienna, Antwerp, London, Amsterdam, Tokio, Melbourne, and Rio de Janeiro. In most cases

they are owned and operated by stock companies or zoölogical societies and visitors who are not members are required to pay a nominal admission fee upon entrance. However, many are free exhibitions of living animals and in many cases the institutions include extensive collections of rare plants, usually brought together from many lands. The Zoölogical Society of London has a membership of about 2,350, each member being charged annual dues amounting to \$15.00, and the receipts are further augmented by the

collection of nominal fees from visitors who do not belong to the society.

In Canada and the United States distinctly

zoölogical gardens are not numerous, but in many parks are collections of animals. Cincinnati, Ohio, has one of the leading establishments of this kind in America. It consists of a fine collection in the eastern part of the city, located on beautiful and elevated grounds. In most cases the zoölogical collections are in parks, such as Lincoln Park, Chicago; Bronx Park, New York City; Highland Park, Pittsburg; and Forest Park, Saint Louis. The National Zoölogical Park at Washington, D. C., was established by Congress in 1889 and is under the direction of the Smithsonian Institution. The leading parks of cities in Canada have similar collections of animals, such as Standley Park, Vancouver. Well-equipped zoölogical collections are maintained in Ottawa, Montreal, Quebec, To-

ronto and other cities of Canada.

ZOÖLOGY (zô-ŏl'ô-jỹ), (a word derived from the Greek zoon, an animal, and logos, discourse), the branch of biology which embraces the study of animals, with reference to their structure, functions, distribution, and classification. It is quite difficult to draw a precise line between zoölogy and botany for the reason that some organisms, low in the scale of life, are of such structure as to be classified by some writers as animals and by others as plants. The subject-matter covering a large field, it is classified into various branches, and these are studied in many schools as distinct sciences. Even in ancient times man gave attention to the study of the lower animals. Thus, Solomon speaks of the habits of the ant, Jeremiah alludes to marine mammals, and Job refers to the peculiar method by which the ostrich incubates its eggs. Many zoölogical facts were recorded by Aristotle and Pliny, but no well-defined attempt was made at scientific classification of animals until in the 18th century. However, many modifications have been made in the study and classification of animals, especially in the 19th century, and it is probable that there are still numerous errors to be rectified by the naturalists of the future.

The chief divisions of zoology include mammalogy, treating of mammals; herpetology, of reptiles; entomology, of insects; ornithology, of birds; ichthyology, of fishes and lower aquatic vertebrates; conchology, of mollusks; arachnology, of spiders, scorpions, and related forms; helminthology, of worms; crustaceology, of the crustaceans; spongiology, of the sponges; and protozoölogy, of the protozoa. These departments were made in accordance with different forms of animal life. However, besides these may be mentioned certain divisions of the subject-matter that refer to aspects in animal life which are applicable to any one or all life forms. Among these are physiology, treating of animal functions, such as nutrition, reproduction, and innervation; anatomy, which investigates the position and relation of organs and parts; embryology, dealing with development from the ovum

to maturity; and classification or taxonomy, which classifies animals into natural groups. Among the names famous in zoölogical research are those of Agassiz, Darwin, Haeckel, Cuvier, Max-Müller, Harvey, Johannes Müller (1801-1858), and Linnaeus. See Amoeba; Animal; Birds; Embryology; Fish; Insects; Mammalia; Reptiles; Vertebrata.

ZOÖPHYTE (zō'ō-fīt), the name applied

by Cuvier to the forms of animal life that more or less resemble a plant in external form or mode of growth, as a coral, sponge, or polyzoan. The animal organisms belonging to this class are fixed to a definite object or spot, as a rock or shell. Many zoöphytes have a close external resemblance to flowers, but they are true animals

instead of massive plants.

ZOROASTER (zō-rō-ăs'ter), the founder of the Magian or Parsee religion, the national religion of the ancient Perso-Iranian people. Writers generally agree that he was born in Bactria, but they disagree widely as to when he lived. Ctesias states that he was a contemporary of Semiramis, hence he must have flourished about 2150 B. C., though others regard him a contemporary of Moses, hence assign him to about 1500 B. C. His religious doctrines are set forth in the Avesta, or Zend-Avesta, and embody a form of dualism as regards the Deity. It was thought that two spirits existed at the beginning of time, the good being known as Ormuzd and the evil spirit as Ahriman. The Zend-Avesta records that Ormuzd revealed the duties of man to Zoroaster and that he is the giver of life and all that is true and holy. Ahriman, on the other hand, is the exponent of darkness and death. This world is represented as the scene of a conflict between the two spirits, but it is promised that Ormuzd will eventually overcome Ahriman and sink him and his followers into darkness, while the faithful are promised perpetual life and bliss. It further teaches that the whole duty of man is to obey the word and commandments of God. Those who remain faithful are promised their reward, while the disobedient are to die the death of the lost. Man is taught the duty of prayer, since God is merciful to those who worship Him and answers the prayers of the good. The Zoroastrian religion prevailed for centuries in Persia. but was displaced there by Mohammedanism after the invasion of 636 A. D. It has since merged largely into the sun and fire worship and is adhered to by the Parsees of Persia and India.

ZOUAVE (zwäv), the name of a light-armed infantryman, originally part of a corps recruited from the Kabyle tribe of Zouaoua, in Algeria, but now a part of the regular army of France. The French occupied Algiers in 1830, when they incorporated the zouaves into their army, but later gradually eliminated the native element from the corps. After 1840 the zouaves were strictly French soldiers, bearing the native name and wearing the native dress. The apparel is Moorish, but the arms and discipline are European, and recruits are obtained by voluntary enlistment. Zouaves wear a loose jacket and waistcoat, usually of blue cloth which is ornamented with yellow braid, a yellow-tasseled fez cap, loose trousers, yellow leggings of leather, and white or yellow gaiters. They are armed with carbines or rifles and carry a sword bayonet. In the American Civil War the zouave uniform was popular on the side of the Northern forces, several regiments of which were uniformed as zouaves.

ZSCHOKKE (tshok'ke), Johann Heinrich Daniel, noted historian, born in Magdeburg, Germany, March 22, 1771; died in Biberstein, Switzerland, June 27, 1848. He studied in the gymnasium of his native city, but in 1788 left that institution to join a company of strolling players. Subsequently he studied in the university at Frankfort-on-the-Oder, where he pursued courses in literature, history, theology, and the sciences, and afterward was a tutor to a family in that city. In 1795 he traveled in Germany, France, and Switzerland, and soon after founded a school in the canton of Grisons. Switzerland. Three years later he published "History of the Free State" and for some time was chief of the department of education of several cantons, including Aargau, Zug, Uri, and Schwyz. He resigned his offices in 1801 and retired to Biberstein in Aargau, but was recalled to public life in 1803, when a new federal union of the Swiss states was established by Napoleon. His historical works include "Bavarian Stories," "Swiss History for the Swiss," "History of the Contest and Fall of the Mountain and Forest Canton," and "History of Switzerland." Among his general works are "The Creole," "Hours of Meditation," and "The Fugitive in Jura."

ZUBLY, John Joachim, clergyman, born in

Saint Gall, Switzerland, in 1725; died in Savannah, Ga., July 23, 1781. He was liberally educated in Switzerland and soon after completing his studies came to America. In 1758 he was chosen pastor of the Presbyterian church in Savannah, where he was a regular pastor for several years, and in 1770 was granted the degree of doctor of divinity by Princeton. He was chosen a delegate to the Continental Congress in 1774, where he took an active interest in promoting the American cause, but afterward sided with the Tories on the ground that he deemed a republic inferior to a monarchy. He was banished from Savannah in 1777, but returned when Sir James Wright was reinstated as royal governor of Georgia, and continued in pastoral work until his death. Joachim and Zubly streets in Savannah were named from him.

ZUCCARO (tsook'ka-ro), Taddeo, painter, born in Sant' Angelo, Italy, in 1529; died Sept. 2, 1566. He took up the study of painting at Rome while a boy and soon established a reputation as a fresco painter. Julius III. and Paul

IV. employed him to execute works on a large scale. Among his leading frescoes are a series in the palace at Caprarola illustrating the achievements of the Farnese family. These were afterward engraved in 45 plates. His younger brother and pupil, Federigo Zuccaro (1543-1609), painted a series of 300 figures in the leading cathedral of Florence. In 1574 he went to England, where he painted portraits of Mary, Queen of Scots, and of Queen Elizabeth. Later he founded an academy of art in Rome. He produced many fine examples of sculpturing and architectures.

ZULU (zoo'loo), the name of a warlike branch of the Kaffir race, which is native to South Africa. Originally the Zulus inhabited a part of the region included in Natal and the country toward the northeast. These people are classified as distinct tribes, differing somewhat in language and minor characteristics, but all are noted for their high degree of physical and intellectual development. Though ordinarily social and amiable, they are good warriors and resisted European encroachment upon their territory with marked heroism. The Zulu government was a form of democracy, in which the chiefs were elected by popular suffrage and held office during the time sanctioned by the people. They practiced a form of polygamy, reared domestic animals, cultivated the soil, and made utensils of wood, stone, and clay. Many of them are now engaged in civilized arts, such as farming, stock raising, mining, and fishing, and some have made considerable advancement in education. Several conflicts between the Boers and the Zulus occurred at different times, but they lived quite peaceably most of the period up to 1879, when the British came in conflict with Cetewayo, King of Zululand. The British under Lord Chelmsford crossed the Tugela and entered Zululand, but were defeated with a loss of 800 men and compelled to retreat. Later the Zulus were defeated. Cetewayo was captured soon after and died in 1884.

Zululand, the chief seat of the Zulus, is now a province of the British colony of Natal. It lies between Natal and Portuguese East Africa, immediately east of the Transvaal, and has an area of about 12,500 square miles. Its population is given at 181,500, including about 1,200 whites. The region was formally annexed to Natal in 1897 and has since been divided into twelve magisterial districts. Agriculture is the chief occupation of the natives, but they also engage in stock raising and trading. The country has considerable mineral wealth in gold, silver, coal, iron, copper, lead, and asbestos. Zululand has been reserved for the natives, only one district being opened to the whites. The Boers invaded the province at the time of the Anglo-Boer war from 1899 to 1900. The province is represented by one delegate in the legislative council at Natal and by one member in the legislative assembly.

ZUNI (zoo'nye), a range of mountains in New Mexico, in the west central part of that political division. These mountains are intersected by the 108th meridian west from Greenwich and lie between the 35th and 36th parallels of north latitude. The general altitude is 6,500 feet. Within these mountains is the village of Zuñi, about 40 miles southwest of Fort Wingate, which is the largest of the Pueblo villages. These Indians were first met with by the Spaniards, in 1539, and they still retain their former modes of weaving, agriculture, and house building. They belong to the cliff-dwelling Indians and constitute a distinct linguistic stock. These natives call themselves Ashiwi, but they are generally known as the Zuñi among the whites. At present they have several villages and number about 1,650.

ZURICH (zoo'rīk), a lake in Switzerland, situated about forty miles southwest of Lake Constance and surrounded by the cantons of Zurich, Schwyz, and Saint Gaul. Its length is about 25 miles; breadth, two to three miles; and the greatest depth, 512 feet. The lake is noted for its fine fisheries and beautiful scenery. Its overflow is carried by the Limmat River to the Rhine. The city of Zurich is near its outlet. In its vicinity are fine gardens, orchards, and farms.

ZURICH, the largest city of Switzerland. capital of the canton of Zurich, at the junction of the Limmat and Sihl Rivers. The city has excellent railroad facilities and has had a remarkable growth in population and industries in the past century. Though the older streets are narrow and tortuous, many notable improvements have been wrought within the last half century, and the city is fast becoming one of the most beautiful of European trade emporiums. The chief buildings include a cathedral founded in the 11th century, a federal polytechnic school, the city hall, and numerous public schools and churches. It has a university which is attended by 1,450 students. In connection with it is a fine collection of botanical specimens and engravings and near by is an observatory. Many of the streets are paved substantially with stone. They are improved by gas and electric lighting, sewer drainage, waterworks, and an extensive system of rapid transit. It has a large public library and may be regarded the intellectual center of German-speaking Switzerland. The manufacture of machinery and cotton spinning are two leading industries, but the silk trade is the most important commercial enterprise. The silk exported annually aggregates a value of \$15,500,000. Other manufactures include steam engines, boilers, paper, chemicals, flour, clothing, tobacco products, earthenware, musical instruments, and utensils. Zurich was the capital of Switzerland until 1848. Austria, France, and Italy signed a treaty of peace here in 1859. Population, 1910, 190,733.

ZUYDER ZEE (zī'dēr zē'), or Zuider Zee,

an inlet from the North Sea, on the north-western coast of Holland, including an area of 1,350 square miles. It formed a marshy lake at the time of Roman occupation, when it was called Flevo, and a small river carried the water to the sea. Subsequently the dikes were broken by several inundations, since which time it has become an arm of the sea. Near its entrance are the four islands of Terschelling, Vlieland, Ameland, and Texel. The government of Holland is now actively prosecuting the work of redeeming Zuyder Zee by means of dikes and canals, which improvement is estimated at a cost of \$50,000,000.

ZWICKAU (tsvik'ou), a city of Germany, in the kingdom of Saxony, forty miles south of Leipsic. It is finely situated on the Mulde River, has large manufacturing interests, and is connected with other cities by a number of important railroads. Four bridges cross the river. The railroad station, which is one of the largest in Germany, includes a number of important buildings. These railway buildings and the machine shops cover about eighty acres. The city is the seat of a penitentiary, has excellent schools and churches, and is the center of a large transit trade. Among the chief manufactures are machinery, glass, chemicals, porcelain, clothing, textiles, and dyestuffs. In the vicinity are extensive coal mines, which employ 12,000 persons. Gas and electric lighting, pavements, rapid transit, and a fine library are among the municipal facilities. Zwickau was mentioned as early as 1118. Population, 1905, 68,502; in 1910, 73,538.

ZWINGLI (tsving'le), Ulrich, eminent reformer, born in Wildhaus, Switzerland, Jan. 1, 1484; died in battle Oct. 11, 1531. He was the son of an officer in his native town, studied at Berne and Basel, and subsequently attended the University of Vienna. In 1506 he became pastor in Glarus, a town near his birthplace, and in the meantime devoted himself to the study of classics and the New Testament. His devotion to study and eminent ability as a pulpit orator soon gave him a wide reputation, and in 1518 he was called to the pastorate of Zurich. He was opposed by many of the monks, but the magistracy of Zurich permitted him to preach the Bible without human additions in all parts of the country under their jurisdiction. The Reformation assumed a formidable aspect in 1522 and Zwingli preached to vast congregations on piety and patriotism, secured an abolition of the law preventing priests from marrying, and obtained other reforms. A general agreement on matters of faith existed between Zwingli and Luther, except on the question whether the body of Christ is really present in the Lord's Supper, Luther affirming that belief and Zwingli holding the view that bread is used merely as a symbol.

In 1531 a war broke out between the Protestant and Catholic cantons and Zwingli went into

the contest as a chaplain, but was slain at Kappel while taking care of a wounded soldier. Though adversely criticised for holding to the virtue of civil war in defense of the faith and common rights, he defined his position by expressing the view that there should be religious liberty and that to defend freedom of worship was battling for the cause of Christ. His chief writing is a work entitled "Of the True and False Religion." He wrote 67 theses and many letters, but formulated no definite system of theology. Many of his works have been translated from the German by Dr. Edward Zeller (born in 1814) and other writers.

ZWOLLE (zvŏl'le), a city in the Netherlands, capital of the province of Overyssel, on the Zwarte Water, about fifty miles northeast of

Amsterdam. It has railroad facilities and is connected by the Willemsvaart Canal with the Yssel River. The Saint Michael's church is its most noted building, which contains many fine paintings and a celebrated organ. Other edifices of note include the townhall, a museum of natural history, and several art and industrial schools. The streets are paved with stone and are traversed by street railways. Among the improvements are electric lighting, a public library, and many promenades. It has a considerable market in cattle, cereals, and fish. The chief manufactures are clothing and ships. Zwolle belonged to the Hanseatic League and joined the United Provinces in 1580. Population, 1907, 34,160; in 1909, 34,224.

PRACTICAL EXAMINER

IN THE

FUNDAMENTALS OF AN EDUCATION

This department is commended to all who desire to widen their fund of general knowledge. It is based upon the underlying principles of mental culture and research. Lists of questions used by the Federal government and principals and superintendents of schools were consulted freely in preparing this feature of the work. Students who are contemplating an examination for a civil service position or a certificate to teach in the schools will find these questions of incalculable value. These interrogatives are more than a mere list to arouse curiosity, but, instead, the numbers on the right hand indicate the pages where the answers may be found. The material was carefully selected and a helpful fund of knowledge is definitely indicated.

AGRICULTURE

DEFINITION: Agriculture is the science which treats of the cultivation of the soil 37, 88 What are the leading courses studied in schools of agriculture?	373 370 153
Is agriculture an old industry? Why?	13
Name some insects that are harmful to the farmer	394
Why are some insects important in agriculture?	94
Name the leading crops of Canada and the United States	71
	38
Name at least six important grasses	80
Mention some important food plants	12
What is meant by a "rotation of crops?"	53
Name the principal constituents of soil	71
In what respects are forests important in aiding agriculture?	32
Why are plant production and animal raising closely related?	32
Are the farms increasing in number and decreasing in size: why:	39
What are the principal crops grown in Nova Scotia? In Florida? In Wisconsin? In New York? In Ontario? In Georgia? In North Dakota? In British Columbia? (See	
the subheads agriculture in articles treating of these divisions.)	
What distinction would you make between a grain and a vegetable?	35
Why is the selection of seed an important matter?	80
Compare the methods of raising corn and cotton. 678, 68	
Mention some improvements made recently in plants	
What are rust and smut and what plants do they injure? 2477, 260	62
Distinguish between floriculture and horticulture	25
What are budding, grafting, and pruning?	
The reader should see the subheads agriculture in the articles which treat of the states, provinces, countries, and continents.	

ANCIENT HISTORY

DEFINITION: Ancient history treats of the civilization and achievements of the na antiquity.	tions of
What can you say of the art, industry, and civilization of Assyria?	171
Locate Babylonia and compare its civilization with that of Egypt	
Write a description of the Sphinx and the pyramids of Egypt	
State the dates and issues of the Punic Wars	
Name the four noted divisions of the ancient Greeks	1195
Give an account of the wars of Alexander the Great	62, 1195
When and by whom was Rome founded?24	
Speak of the three periods of Rome—the kingdom, the republic, and the empire24	42, 2444
Name six eminent Romans 115 184 389 429 5	80 2268

Give a brief account of Queen Dido and the Carthaginians	1111 950 940 568 2444 2442 1315 1248 965 716 2696
ASTRONOMY	
DEFINITION: Astronomy is the science which treats of the heavenly bodies and inv	vesti-
	179
Who is regarded the early founder of astronomy? What is the length of the lunar day? Name the phases of the moon What is an almanac and when did it come into use? Distinguish between the terms apogee and perigee, between aphelion and perihelion. What is an alteroid? How many asteroids are there and what is their mass? Give a list of the more important symbols used in astronomy. What are aurora borealis and aurora australis? Give their causes. Who discovered Biela's comet and in what years was it seen? What is a comet? How many comets have been studied? Same some of the substances found in aerolites. What science is regarded the parent of all the sciences? Name and describe the four primary classes of clouds What is the most conspicuous constellation of the Southern Hemisphere? Name and describe the four primary classes of clouds What is gravity? By what agencies is the force of gravity modified? Name some eminent ancient and modern astronomers How many stars in the constellation Orsa Major, in Ursa Minor? What is dew and when is air said to have reached the dew point? When and by whom was Donati's comet discovered? How is astrology related to astronomy? Is the former considered worthless at present? 172, Which planet is most like the earth and how does it appear to the naked eye? Where is the constellation Orion and what four stars are south of it? What is the ecliptic and why is it so named? Where are the mountains of the moon named? What is their height? Of what are nebulae composed and how many different classes are there? Where are the mountains of the moon named? What is their height? Of what are nebulae composed and how many different classes are there? Where are the most important observatories and when were they established? How many stars are of the first magnitude, of the fourth? What is the atmosphere? What substances are contained in it? Explain the cause of an eclipse of the moon. Can an eclipse of the moon be annular? What is the atmosphere? What substances are contained in it? Explain the cause o	1842 74 118 171 174 186 640 639 26 173 607 713 2715 1184 173 2715 1184 173 2715 1715 2054 866 1479 1715 2054 866 1479 1715 2054 2055 2054 2055 2055 2056
Ompare the earth and moon as to surface, bulk, and mass	1842
What is precession as applied to astronomy and what causes it?	2302
Give a list of the principal satellites of our solar system. Which is the largest?	2535
Explain the causes of the change of seasons. Where do only two seasons occur?	2729
Is the size of the stars known to us? About how many are there?	2729

What planet is second in size? Locate it in space. How many satellites has it?2535,	2536
What substances are known to be contained in the sun?	2776
Explain the theory of the tides. What are flood and ebb tides?	2876
What is a transit? When have transits occurred? Why are transits of Venus important? Is Uranus a superior planet? What is its diameter? What is the length of its year?	3000
How long are the solar year, the sidereal year, and the lunar year?	3203
Into how many constellations is the zodiac divided?	3223
What gives rise to the Milky Way or Galaxy? What other names are used?	2776
What gives rise to the Milky Way or Galaxy? What other names are used?	1788
What are the effects of the heat of the sun upon the earth?	2111
BIBLICISM	
DEFINITION: Biblicism is the learning or literature which relates to the Bible.	007
What is the oldest and most famous version of the Old Testament?	287 119
Who is known as "the sweet singer of Israel?"	759
Who is known as "the sweet singer of Israel?"	1857 2589
Why was Moses forbidden to enter the promised land? By whose influence did Ahab introduce the worship of Baal in Israel?	1858
By whose influence did Ahab introduce the worship of Baal in Israel?	1458
How many books are there in the Apocrypha? Name them	$\frac{64}{289}$
What effect did the marriage of Athaliah with Jehoram have upon Israel?	175
Tell of the Syric, the Coptic, and the Gothic versions of the Bible	288
Who was the spokesman of Moses at the court of Pharaoh? Name the twelve apostles. Who succeeded Judas Iscariot?	2
Name the twelve apostles. Who succeeded Judas Iscariot?	119
What name was borne by Uzziah, the tenth King of Judah?	200 289
In what book of the Bible is the song of Deborah? To what tribe did she belong?	767
Where is it thought that the Garden of Eden was located? Why was Cain led to kill his brother Abel?	869 431
When was Ahaz King of Judah? What can you say of him?	41
What is an archangel? What is said of the archangel in I. Thess. iv., 16?	$\frac{131}{202}$
What prophet was cast into a lion's den for his steadfastness to the worship of God?	749
When, where, and by whom was the Douay version of the Bible published?	819
Speak of the teachings of Christ as influential upon the education of man	874 901
What is the meaning of Jehovah as explained in Exodus?	1448
Name all the books of the Bible, including the Apocrypha	289 577
Name the fifth son of Jacob. To what tribe did Samson belong?	2513
Who was the second King of Israel and by whom was he succeeded?	2672
What is said of Tubal-Cain and Jubal as teachers? Of what did Ezekiel prophesy? Who introduced the Chaldee characters into Jewish litera-	873
Of what did Ezekiel prophesy? Who introduced the Chaldee characters into Jewish litera-	001
ture? Who wrote the book of Ezekiel? Of Ezra?	964
Whose predictions foreshadowed the restoration of Jewish prosperity?	1231
In what battle was Absalom slain? How was he slain?	2154
How was Esau defrauded out of his birthright and what tribe did he found?	935
Name the two wives of Jacob. How old was he at the time of his death?	1431
Give an account of Lot. What peoples descended from him?	1629
Of whom does the book of Ruth give an account?	2477
Give a biographical sketch of Iesus. When did His death occur?	1416
Give a biographical sketch of Jesus. When did His death occur?	1459
Into what three epochs may the life of Moses be divided?	1472
What was given by God as the sign of the covenant? What can be said of Saint Paul as	1000
a teacher of Christianity?	2125
Who was king of the Jews at the time of the massacre of the children of Bethlehem? What period may be considered the golden age of Jewish history?	1456
At what age and where did Joshua die? Whose successor was he?	1472
In what year probably was the gospel of Saint Mark written?	1710
The me me mount of jesus. Thouse made did not death occur. 11100,	1120

Now many minor prophets are there? Name them. Why were they so called?1803,	1010
What Israelite was a cupbearer to Artaxerxes Longimanus, King of Persia?	1915
At what time did the Sadducees come into prominence? Whose dying words were, "Little children, love one another?" How many pieces of silver did Judas Iscariot receive for betraying Christ?	1461
How many pieces of silver did Judas Iscariot receive for hetraving Christ?	1475
What book of the prophets has only one chapter of twenty-one verses?	2013
What were the teachings of the Lewish order of scribes?	2568
From whom did the Zebulunites descend?	3217
What were the chief doctrines of the Sadducees?	2482
Who were Zechariah and Zedekiah? Define Talmud, Gemara, and Mishna. What do the Jews think of the Talmud?	3217
Define Talmud, Gemara, and Mishna. What do the Jews think of the Talmud?	2811
How did the Israelites construct synagogues while in exile?	2799
What was the Great Sanhedrim and how was it constituted?	2520
Who was the first King of Israel and who succeeded him?	2536
BIOGRAPHY	
BIOGRAPHI	
DEFINITION: Biography is the department of literature which treats of the lives of per-	sons.
Contrast the meaning of biography and autobiography	2114
Why have the remains of Shakespeare not been removed to Westminster Abbey?	2603
What famous inscription is found on the monument of Benjamin Ionson?	1470
What famous inscription is found on the monument of Benjamin Jonson?	11.0
fic Railway a possibility?	1660
Give an account of Emilio Aguinaldo	2191
Give an account of Emilio Aguinaldo	53
Speak briefly of the life and successes of Michael Angelo	101
When and why was John Brown executed?	381
Was Henry Clay a supporter of the War of 1812? What is he often called?	597
Who established the Cooper Union and for what purpose was it founded?	667
What eminent writer was a prominent factor in the Dreyfus trial?	3223
Who organized the state of Deseret?	
Name the war governor of Illinois	3202
Who were candidates for President at the time John Quincy Adams was elected?	19
Name the Pilgrim Father who first set foot upon Plymouth Rock	50
Name the Pilgrim Father who first set foot upon Plymouth Rock	2565
How did P. T. Barnum make his first great financial success?	234
What eminent author was an active organizer of the Free-Soil party?	391
Who organized The American Society for the Prevention of Cruelty to Animals?278,	716
What eminent author was an active organizer of the Free-Soil party?	3221
Give an account of three noted Americans by the name of Abbott	3
Who wrote his own epitaph long before his death?	1056
What Japanese statesman did much reform work?	3201
What is said of the wife of Socrates?	3194
Whose doctrines were formally condemned thirty years after his death? Of what colony was Roger Wolcott governor for several years?	3191
Of what colony was Roger Wolcott governor for several years!	2150
Who was the first emperor of modern Germany?	3114
When and whom did George Washington marry?	3097
When and whom did George Washington marry?	3078
Who was the first King of United Italy?	3043
What President of the United States was the son of a President?	19
What eminent Greek king studied three years under Aristotle?	62
Who was the fourth president of the Mormon Church?	3179
Whom did the Duke of Wellington marry?	3120
Who was the first president of Amherst College?	3114
Name the principal writings of Frances E. Willard	34
Of what colony was John Winthrop governor for a long time?	2166
Who was Governor General of Cuba immediately preceding the Spanish-American War?	3130
What statesman is known as the "Watch-dog of the Treasury?"	3089
Who reigned longest of the English sovereigns?	3046
Who is noted as the leading factor in promoting the Tuskegee Institute?	3095
Name some famous women	3097
Name some famous women	3150
Who was called "The Little Magician?". Give an account of Count Tolstoi and speak of his writings.	3016
Give an account of Count Tolstoi and speak of his writings	2891
Tell of the peculiarities of Henry David Thoreau	2868
Give an account of the travels and writings of Bayard Taylor	2827
With whom did W. T. Sherman make his home after the death of his father?	2013
Where and when was William Shakespeare born?	2002

CLASSIFIED QUESTIONS	3233
Name a powerful Queen of Assyria and Babylonia What British novelist was an ingenious story-teller? Relate the legend associated with Tannhäuser. Who was expelled from the United States Senate in March, 1861? What Union general was called the "Rock of Chickamauga?" What prominent American visited Palestine in 1889? What noted poet was drowned in the Gulf of Spezia? Give a brief outline of the public life of Carl Schurz What English writer defended Pre-Raphaelitism?. Who made large donations to the public library of New York? When was Tenuyson made poet laureate and whom did he succeed as such? What can you say of the life and public work of John Sherman? Name an eminent French letter writer of the 17th century. In what battle was General Santa Anna severely wounded? Give an account of the Siamese twins. What eminent French lady exercised much influence as a Girondist? Name a noted admiral who died at the time of his greatest victory. What explorations were made by Nils Adolf Nordenskjöld? Who is at present the King of Sweden and when was he crowned? Was Pericles a benefactor of Athens? What is the time in which he lived called? What navigator became closely associated with the colonization of Virginia? What marshal of France had five horses shot under him in the Battle of Waterloo? Name an eminent supporter of the so-called higher criticism. Give a list of important discoveries made by Louis Pasteur What were the causes that led to the execution of Robespierre? Review briefly the events in the life of Whitelaw Reid What can you say of the government of Pennsylvania under William Penn? What army officer was remarkable for his vivid imagination? What army officer was remarkable for his vivid imagination? What eminent English poet was blind? Name a prominent financier of the Revolutionary period? Who was the leading strategist at the time of the Franco-German War?	2565 2814 2895 2895 2811 26111 26111 26111 26112 2615 2845 2845 2625 28464 2524 2625 2437 1920 2119 2119 202 2159 2159 2429 2159 2429 2159 2818 2818 2818 2818 2818 2818 2818 281
	1020
CANADIAN HISTORY	
DEFINITION: Canadian history is the story of the settlement and progress of British America.	lorth
Who discovered the coasts of New Brunswick and Newfoundland in the 10th century? 456, Name six noted explorers whose names are connected with the early history of British	
America	457 457
In what war were the battles of Lundy's Lane and Queenstown Heights fought?1645, In what year and when was the Dominion of Canada created?	457
What are the forms of government in Newfoundland and in New Brunswick?1935, Which is the largest Province of Canada and which is the most populous?455, When was British Columbia admitted into the Dominion? 378: Manitoba?	1938 2039 1697
When and where did the Riel Rebellion occur?	2066
What are the Maritime Provinces? Which was the last to enter the Dominion?	$\frac{457}{2100}$ $\frac{2350}{2350}$
What extensive industries are promoted in Canada?	2936 454 2757
By what treaty and when was New Brunswick ceded to the British?	161 458
In what year and how was the Canadian-Alaskan boundary settled?	
Emperor of Germany?	378

What are the principal provisions of the Quebec Act? What were the Clergy Reserves?	457 600
	456
CIVIL GOVERNMENT	
DEFINITION: Civil Government is the science which treats of the civil duties of citizen and the authority of the state or nation.	the
Name and define the principal forms of government	1173
What are the duties of the President of the United States?	
(See subheads aggregated in the articles that treat of the provinces)	
Define impeachment and name some prominent men who were impeached	1371
What is international law and how is it applicable?	1397
Define localization and centralization. Of what two houses does Congress consist? How many members in each house?	522
Of what two houses does Congress consist? How many members in each house? Define constitution. How can a constitution be changed?	653 661
Are the President and Vice President chosen by a direct vote?	888
Define the executive branch of government	958
What form of government is best for an intelligent people?	1172 2976
How are the State governments constituted?	2984
What are letters of marque and reprisal?	1575
What is an income tax? Has that form of taxation been imposed by the United States? What decision regarding this tax was rendered by the Supreme Court?	1372
What is a jury? How many classes are there?	1480
What is an aristocratic form of government?	1173
Define debt. Is the possibility of going into debt an advantage?	767
What is an election? How are elections governed?	888
How many electors has each State according to the law of 1901?	2078
What is a direct tax? an indirect tax? an income tax?	2826
Define government. Is it an essential element in civilization? How many electors has each State according to the law of 1901? What is a direct tax? an indirect tax? an income tax? What is a grand jury? a petit jury? a coroner's jury?	1480
State the conditions of eligibility of senators and representatives	2900
What is it to vote? How is voting done at public election?	3064
Name the nine cabinet offices. How are the offices filled	2991
Has the rural population grown as rapidly as that of cities?	2975
What is a postage stamp, a revenue stamp?	2723
Define absolute and limited monarchies. Give examples of each	1824
Into how many classes is mailable matter divided? Frumerate them	2291
When were the different states admitted into the Union? Define citizen and citizenship. May all foreigners become citizens?	2978
What Vice President was elected by the Senate?	1464
What Vice President was elected by the Senate?	681
What are the three most prolific sources of crime?	705
Name and define the three branches of government	1173
What is usury? What are legal rates of interest?	3004
Repeat the preamble to the Constitution of the United States	2641
Define majority and plurality. Illustrate	1682
Compare Massachusetts as to size and population	1729
How many members were in the first Senate? How many are there at present?	653
In what year was it decided to call the chief executive President?	2305
What number of members constitutes a quorum in each house of Congress?	2358 589
When do the regular meetings of Congress occur?	653
Name the original thirteen states	2978
What salary is paid to the President?	2975
What salary is paid to the President?	671
What is a patent and how much is the fee? How many patents were issued in 1907?	2993
What is a patent and how much is the fee? How many patents were issued in 1907? When and where did the First Colonial Congress meet? When were international copyrights first recognized?	653
When were international copyrights first recognized?	671
Explain the system of government surveys Under whose direction is the post office system?	2992
When were the provinces admitted into the Dominion of Canada?	1696

DISCOVERIES

DEFINITION: A discovery is the act of finding something which was previously unknown or unrecognized. Who discovered that the acceleration due to gravity is the same in all falling bodies. 973
When and where did Columbus first reach land in America? 636
Who made important discoveries regarding the diseases of the silkworm? 2120
Name some of the discoveries of Scheele. 2547
Who discovered that the Nile is the outlet of the equatorial lakes of Africa? 2704 Who reached the farthest point north in exploring the Arctic regions? 155, 004, 2154, 2251
Who discovered the power of steam? 3105
When and by whom were the Philippine Islands discovered? 1673, 2191
When was the region included in Argentina first explored? 138
When and by whom were the Solomon Islands discovered? 2673
What discoveries were made by Henry Hudson? 1331
Who discovered the northeast passage? 1983, 2077
When and by whom was the magnetic North Pole discovered? 1675, 2452 ECONOMICS AND CIVICS DEFINITION: Economics is the science of the useful application of material resources; civics is the science of civil government. (See page 2254.) What is meant by productive labor and unproductive labor? 294 350 225 Where are the principal banking and money centers of Europe?

Distinguish between a private and a common carrier

What is meant by centralization as applied to government?

Define commerce. Who were the most noted commercial people of antiquity?...

What are the objects of coöperation as applied to the industries?...

Name the principal kinds of banks. What are clearing houses?

What circumstances have caused variations in the relative value of gold and silver?...

Define citizen and citizenship. When do Indians become citizens?

Define consumption. Illustrate productive and unproductive consumption

Explain customs duties. How much money has been collected in the United States by these 491 522 640 667 226 294 587 662 Explain customs duties. How much money has been collected in the United States by these 732 1525

When was the first coinage law enacted in the United States? What are the denominations	
of gold and silver coins?	620
Define credit and explain how the credit system has been beneficial	699
What is exchange? In exchange, must value be given for value?	957
Give an outline of the general objects of the labor movement of recent times	
State some of the elements that should characterize the substances used in making money.	1000
Define legal tender, token money Name the four leading schools of political economy and compare their teachings	1820
Name the folia leading schools of pointed ecolomy and compare their teachings	9991
Speak of the advantages urged for a general system of protection	2307
Who originated the single tax theory?	2641
Who originated the single tax theory?	2121
Define capital, exchange, consumption, value, production, land, and labor	2255
Explain the difference between a serf and a slave. What advantages are argued in favor of the single tax system?	2590
What advantages are argued in favor of the single tax system?	2641
What classes of property are generally exempt from taxation?	2827
Ought the wages of a laborer be based upon the hours employed or the results achieved? Ex-	
plain the difference between nominal and real wages	3068
When and by whom was wampum used as money?	3079
Define reciprocity. Why do many English statesmen ravor an imperial custom tariff?	2384
What are savings banks and when were they first established?	2008
What theory is advanced by scientific socialism?	2001
What are trades unions and how have they benefited laborers?	2007
Define usury. Are contracts that provide for excessive interest collectible?	3004
How are the savings banks of the United States controlled?	2539
Did the Greeks and Romans maintain systems of slavery?	2650
What are the chief aims of the Christian socialists? How were taxes levied among the ancient nations?	2668
How were taxes levied among the ancient nations?	2826
Can the rate of wages be fixed satisfactorily by statutory law?	3069
What threefold test is used by most writers to determine whether a commodity may be	
classed as wealth?	3109
Why are duties on exports forbidden by the United States Constitution?	731
ELECTRICAL SCIENCE	
ELECTRICAL SCIENCE	
DEFINITION: Electrical science investigates the phenomena and laws of electricity.	
	892
Were the phenomena of electricity known to the people of ancient times?	1892
Were the phenomena of electricity known to the people of ancient times?	1892 890
Were the phenomena of electricity known to the people of ancient times?	1892 890
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 405
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1674 1090 897 895 891 891 2001
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 405 2201 2630
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 405 2201 2630 2837
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 405 2201 2630 2837
Were the phenomena of electricity known to the people of ancient times?	1892 890 91 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 405 2201 2630 2837
Were the phenomena of electricity known to the people of ancient times?	1892 890 1580 3061 269 1590 196 1975 147 898 1590 1674 1090 897 895 891 405 2201 2630 2837 2838 1056
Were the phenomena of electricity known to the people of ancient times?	1892 890 1580 3061 269 1590 196 975 147 898 1674 1090 897 895 2201 2630 2837 2838 1056
Were the phenomena of electricity known to the people of ancient times?	1892 890 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 2201 2630 2837 2838 1056
Were the phenomena of electricity known to the people of ancient times?	1892 890 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 2201 2630 2837 2838 1056 898 892 427 851
Were the phenomena of electricity known to the people of ancient times?	1892 890 1580 3061 269 1590 196 975 147 898 1590 1674 1090 897 895 891 2630 2837 2838 1056 898 892 427 3197
Were the phenomena of electricity known to the people of ancient times?	1892 890 3061 269 1590 196 975 147 898 1674 1090 897 895 2201 2630 2837 2838 1056 898 892 427 898 892 427 897 3220
Were the phenomena of electricity known to the people of ancient times?	1892 890 3061 269 1590 1990 1975 147 898 1590 1674 1090 897 895 2201 2630 2837 2838 1056 898 892 427 851 3197 3220 406
Were the phenomena of electricity known to the people of ancient times?	1892 890 3061 269 1590 1990 1975 147 898 1590 1674 1090 897 895 2201 2630 2837 2838 1056 898 892 427 851 3197 3220 406

CLASSIFIED QUESTIONS	3237
How does electricity furnish protection against thieves? What is a long-distance telephone? When was the first line completed? Can motors and electric lamps be utilized on one wire without a circuit? What effect has an aurora borealis on the magnetic needle? What current is required for a sixteen candle power incandescent lamp? Explain static and dynamical electricity. Why has the X-Ray particular value in surgery? What are earth currents? Who discovered the magnetic North Pole? When? Explain the theory of the Toepler-Holtz electric machine What is said of the magnet at the Stevens Institute of Technology, New York? What can you say of the utility of Niagara Falls in propelling electrical and other machinery? 398,	2838 2984 186 896 890 3196 857 2452 894 1675
GAMES AND SPORTS	
DEFINITION: Games and sports are pastimes that are played for amusement, profit recreation.	, or
Why were the Olympic games beneficial to ancient Greece? What is considered the national game of the United States? Draw a baseball ground. Write an essay on yachting and mention the Shamrock III	3198 2417 3138 2361 1224 770 971 2922 1146 1552 2888 11024 3198 3186 1352 2341 2666 712
the games	3082 1529
GEOGRAPHY	
DEFINITION: Geography is the science which treats of the earth and its inhabitants.	
Into what four branches or departments is geography divided? Define geographical distribution, 1111; what are some of the barriers against wide diffusion? Name some noted geographers	2755 3126 848 190 31 1358 200 67 1987 498 2084 28 3126 1343 945 110 2787 29 1377 179 3224

7 73 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Is Bolivia larger than Chile?	, 559
Where are the Caroline Islands, and to what country do they belong?	. 488
In what country is Yokohama? On what island?	320
Describe the surface and products of Siberia	262
Speak of the climate and resources of Nicaragua	1960
What countries have possessions in New Guinea?	1046
Outline the boundary of the Pacific Ocean. What is its area?	2076
Outline the boundary of the facilit Octail, what is its area:	0110
How high do the tides rise in Passamaquoddy Bay?	2113
what and where is New Zealand? Describe the surface	1965
Name the chief productions and the leading cities of Norway	, 1999
What are the area, productions, government, and population of Paraguay?	, 2103
Name the chief productions and the leading cities of Norway	2247
Name the principal divisions and islands of Polynesia	2264
What is the area of Prussia? Name its chief rivers	2325
What country is the lowest in Furone?	1995
What country is the lowest in Europe? Name the departments of Porto Rico and give their population Describe the surface of Persia and speak of its chief industries	9984
Describe the surface of Persia and speak of its chief industries	2163
Name the turble emissional ideals of the Diliceins	0107
Name the twelve principal islands of the Philippines	2101
Describe the surface, boundary, and rivers of Portugal	2280
Compare the length of 24 large rivers of the world	2425
Locate and describe Nova Scotia. To what country does it belong?	2001
Give the area, wild animals, and productions of Peru	2169
Speak of the rainfall in North America. Are the Pacific highlands arid?	2369
Locate the Rocky Mountains and name their principal peaks	2433
Name the principal rivers, lakes, cities, and seas of Russia	2467
What are the right bank, the source, the mouth, and the basin of a river?	2425
Locate and describe Rhodes. To what country does it belong?	2400
Describe the city of Rome. Of what country is it the capital?	9440
Describe the City of Rolle. Of What Country is it the capital	0400
Describe the city of Rome. Of what country is it the capital?	2400
which is the most northwesterly republic of Central America? Name its capital321,	1317
Name and locate the capital of Austria-Hungary	3040
Describe the Sudan. Give its boundaries	2767
Where are the Carpathian Mountains? Describe them	488
What is the length of Chile? State the area and population	560
Name the chief products of China and Japan	1439
Name the chief products of China and Japan	705
State the causes of oceanic currents and mention their utility	728
What sea is east of Egypt? What sea is north of that country?	882
Into how many divisions did Cuvier classify the races of mankind?	941
Where is Greenland? To which country does it belong?	1199
What and where is Cevlon? Of what country is it a colony?	525
	F774
What are the leading industries of Cuba?	720
What are the leading industries of Cuba? What and where is the English Channel? How wide is it?	023
Pound Sonin What is its form of covernment?	2605
How many sities of Common hours a population of over 200 000?	1198
Now that yelloss of Certainy have a population of over 200,000:	2041
Name the products of Turkestan, of Turkey	0076
Define spring tides and neap tides	0575
Explain the cause of the change of seasons.	400
Locate and describe the Cascade Mountains	490
What and where is Cyprus? Describe the surface	730
Locate and describe the Cascade Mountains	2466
In what regions are active volcanoes?	3061
Where is Tunis? To what country does it belong?	2934
Of what country is Syria a political division? Since when? What is the temperature of the sea? Why does it not freeze solid? What and where is Saxony? Give the capital	2801
What is the temperature of the sea? Why does it not freeze solid?	2571
What and where is Saxony? Give the capital	2542
Round Manitoha What are the area and products?	1695
Describe the surface and coast of Madagascar. Name the capital	1660
Enumerate the natural resources of Mexico; the manufactures	1774
Describe the Danube. Is it important in commerce? Why?	752
Describe the Danibe. Is it important in commerce: Why:	2020
Locate and describe the city of Venice	0000
winat and where is lasmania? Name its principal rivers	2022
Where is Lake Tsad and what rivers flow into it?	2929
What mountains traverse Servia? How high are they?	2592
Why is the freezing point of sea water lower than that of fresh water?	2572
Describe the surface of Scotland and speak of its lakes	2562
What is the area of the Hawaiian Islands? Which is the largest?	1265
Where are the Himalaya Mountains? Name the highest peak	1302
What is the general elevation of Louisiana?	1634
Explain the cause of day and night; of summer and winter	2575
Bound Tripoli and name its chief cities	2931
Round Venezuela What is its form of government?	3022

What island is a part of British Columbia? How is it separated from the mainland? Through what cities would you pass in riding by railway from Halifax to Vancouver? (See map of Canada.)	3016
Name the principal lakes of Manitoba and Saskatchewan	2494 2002 2311
Name and describe the principal islands of Franklin and of the Gulf of Saint Lawrence. 1055, What can you say of the surface of Ontario? Of the products?	2494
How is Ontario separated from New York? From Pennsylvania? From Michigan?2037, What city is the greatest grain market of Great Britain? Why?	3164 454 , 2532
What bay separates Ungava from Keewatin? What strait separates it from Franklin? 2959 (See map of Canada.) Where are the principal forests of Canada? The chief fisheries?	453
Locate Ottawa and name its principal railways and leading buildings	455
tion? Has the wealth of the nation increased rapidly the past decade? Has the population increased? What are the leading minerals? Name at least ten forest trees of the Dominion. 377, 453,	$\frac{458}{2038}$
UNITED STATES GEOGRAPHY	
DEFINITION: The geography of the United States is a treatment of the geographical nomena of the United States and its colonies.	phe-
Which is the most northerly State? The most southerly? 1799, Where is Albemarle Sound? Chesapeake Bay?	2963 3093 1502 2963 1018
When was Washington admitted as a State? Oklahama?	2079
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York What minerals are obtained in Kentucky? In Minnesota? In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. 2024.	2978 1956 1800 1914 3169
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York 1365, What minerals are obtained in Kentucky? In Minnesota? In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. 2024, Describe the boundary and surface of Colorado. Of Utah. 630, Compare Washington with Oregon as to size, climate, and products 2049, How many physical divisions are there in the United States? Describe the Alabama River: the Ohio River. 47.	2978 1956 1800 1914 3169 3004 3093 2978 2022
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York 1365, What minerals are obtained in Kentucky? In Minnesota? In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. 2024, Describe the boundary and surface of Colorado. Of Utah. Compare Washington with Oregon as to size, climate, and products Describe the Alabama River; the Ohio River. Describe the Alabama River; the Ohio River. 47, Name the principal cotton-producing states. 687, Which State is the largest and which is the smallest in size? Describe and draw an outline map of Delaware. Compare Wyoming with Montana in respect to size and products. 1833,	2978 1956 1800 1914 3169 3004 3093 2978 2022 2972 2978 774 3191
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York What minerals are obtained in Kentucky? In Minnesota? Iso1, In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. Describe the boundary and surface of Colorado. Of Utah. Compare Washington with Oregon as to size, climate, and products Describe the Alabama River; the Ohio River. Describe the Alabama River; the Ohio River. Name the principal cotton-producing states. Describe and draw an outline map of Delaware. Compare Wyoming with Montana in respect to size and products In what city is the "Cradle of Liberty?" 344, Give a list of the colonies of the United States. 1265, 2187, On what river and in what states are Philadelphia and Trenton?	2978 1956 1800 1914 3169 3004 3093 2978 2022 2972 2978 774 3191 49 975 2984 2181
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York 1365, What minerals are obtained in Kentucky? In Minnesota? In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. 2024, Describe the boundary and surface of Colorado. Of Utah. Compare Washington with Oregon as to size, climate, and products. Describe the Alabama River; the Ohio River. Describe the Alabama River; the Ohio River. Which State is the largest and which is the smallest in size? Describe and draw an outline map of Delaware. Compare Wyoming with Montana in respect to size and products. In what city is the "Cradle of Liberty?" Name the principal of the colonies of the United States. Name and locate the capitals of all the states. Describe the surface and enumerate the leading products of Texas 2851, Between what two rivers is Iowa located and which is the largest river within the State? 787, Name the principal minerals of the United States and state where they are found.	2978 1956 1800 1914 3169 3004 3093 2978 2022 2972 2978 3191 49 975 2984 2181 2978 2852 2471 2970
When was Washington admitted as a State? Oklahoma? Name the principal rivers of Illinois. Of New York What minerals are obtained in Kentucky? In Minnesota? Iso1, In what State and on what river is Omaha? Saint Paul? Name fine cities in Ohio and five in Wisconsin. 2024, Describe the boundary and surface of Colorado. Of Utah. Compare Washington with Oregon as to size, climate, and products. Describe the Alabama River; the Ohio River. Name the principal cotton-producing states. Compare Wyoming with Montana in respect to size and products. Describe and draw an outline map of Delaware. Compare Wyoming with Montana in respect to size and products. Iso3, Describe the surface, contour, and products of Alaska In what city is the "Cradle of Liberty?" 344, Give a list of the colonies of the United States. Describe the surface and in what states are Philadelphia and Trenton? Name and locate the capitals of all the states. Describe the surface and enumerate the leading products of Texas. 2851, Between what two rivers is Iowa located and which is the largest river within the State? 787.	2978 1956 1914 3169 3004 2978 2072 2978 3191 49 9984 2181 2978 2852 2978 2852 2978 2852 2978 2852 2978 2852 2978 2978 2852 2978 2978 2978 2978 2978 2978 2978 297

What eniment divine closed a plea with the words, There I take my stand, I can do no other-	
wise; so help me God?"	1647
By whom and of whom was it said, "To the victor belongs the spoils?"	1429
Who said, "All we ask is to be let alone?"	760
Whose dving words were, "Don't give up the ship?"	1553
Who was called the "Good Queen?"	1633

What are the "Madison Papers?"	2162
What are the "Madison Papers?". Whose sermons were said to be "born not on his lips but in his soul?"	1647
What Roman woman said of her sons. "These are my jewels?" 679.	1174
What Roman woman said of her sons, "These are my jewels?"	
"But nevertheless it does move?"	1087
What did Lincoln say about slavery in 1862?	. 908
What flag bore the motto, "Don't tread on me?"	1009
Who said, "I have just given to England a maritime rival that will, sooner or later, humble	1005
her pride?"	1637 946
Who is known as the "Wizard of Menlo Park?"	871
What did Addison say of the ducking stool?	837
What did Addison say of the ducking stool?	308
What did Plato say of Socrates?	2670
Who was "Rough and Ready?" What expression did Gen. John Stark make at the Battle of Bennington?	2829
What expression did Gen. John Stark make at the Battle of Bennington?	2727
Who was called "Watch-dog of the Treasury?"	3089
What is Black Friday?	$\frac{305}{2171}$
What American said, "We have lived long, but this is the noblest work of our whole lives?"	1637
Who is known as "the schoolmaster president?"	
Who was called "the sweet singer of Israel?"	759
What statesman was known as the King Maker?	3088
What statesman was known as the King Maker?	0.0
men?". When was "The era of good feeling?". On whose tombstone is the couplet naming four continents?	3096
When was "The era of good feeling?"	1831
On whose tomostone is the couplet naming four continents?	287
Which is "the book of books?" Who exclaimed, "Eureka! Eureka!" on making a discovery?	131
Who said. "The people want to be humburged?"	234
Who said, "The people want to be humbugged?". From what circumstance arose the proverb, "To shun Charybdis and fall into Scylla?"	2570
What statement was imputed to Chief Justice Taney?	2814
Of whom was it said that she "was busy from morning till night providing comforts for the	
sick soldiers?"	3097
How did the word Yankee originate?. What is meant by kissing the blarney stone?	3201 310
What is meant by kissing the biarney stone: Give a familiar quotation from John Trumbull	85
Give a familiar quotation from John Trumbull. Of whom was it said, "There is but one wit in England?" Who said, "I propose to fight it out on this line if it takes all summer?" When? When was the expression "government by injunction" originated?	1846
Who said, "I propose to fight it out on this line if it takes all summer?" When?	1180
When was the expression "government by injunction" originated?	767
Who was known as the "Iron Chancellor?"	301
Who originated the proverb, "Procrastination is the thief of time?"	3210
Whence came the saying, "The cat in gloves catches no mice?"	85 768
Of whom was it said that he did the "most daring act of the age?". How did T. J. Jackson come to be called "Stonewall?" What inscription is on the monument of Ben Jonson? Who was called "Light Horse Harry?". What was called a "cheese box on a raft?".	1430
What inscription is on the monument of Ben Jonson?	1470
Who was called "Light Horse Harry?"	1560
What was called a "cheese box on a raft?"	932
Who is the "Hero of Manila?"	792
What exclamation did Caesar make at the time of his assassination?	430
What is implied by the saying, to cut the gordian knot? What was the riddle of Spiny solved by Oedious?	2020
What was the riddle of Sphinx solved by Oedipus? Who were the seven wise men, and what are their characteristic sayings?	2595
What did Admiral Dewey say of W. S. Schley at Santiago?	2551
What did Admiral Dewey say of W. S. Schley at Santiago?	3109
HISTORY OF EDUCATION	
DEFINITION: The history of education is the history of the principles, methods, and it	insti-
tutions by means of which mankind has been educated, from the earliest period of historic t	imes
to the present day.	
What is the threefold aim of education?	872
Define pedagogy and write an essay on the subject	2135
What do you understand is meant by the culture eboch theory?	2138
Who is regarded the most eminent philosopher of ancient Greece?	140
What can you say of the state of education in Assyria?	171
Speak of the culture and literature of Babylonia	204
Speak of the influence of the Byzantine Empire upon learning during the Middle Ages	378 423
What influence did Caesar exercise upon the improvement and education of Rome?	430
What is a catechism and when was the first book of this kind oublished?	505

CLASSIFIED QUESTIONS

Explain the utility of passenger elevators	900
Who invented the Drummond light? What is a dial? Where was the first dial of which we have any record?	834 793
Who invented the safety lamp?	762
Why is a diving bell so called?	OUE
What is a Crookes tube? For what is it used?	711
What is a vestibule train? Who designed it?	2367
What is a double-track railroad?	2367
What is a double-track railroad?	1190
When and where were steel needles first manufactured? What is a flying machine?	1917
What are flint implements?	1014
When was gunpowder invented?	1991
When were lead pencils first made?	2146
When and by whom was the lightning rod invented?	1056
By whom was the Ferris wheel designed? When and by whom was the first needle gun made?	990
When and by whom was the first needle gun made?	831
Where is one of the most remarkable clocks?	606
Who invented the self-intensifying process of making liquid air?	2920
Who were the first successful manufacturers of fireworks? Why is a spirally grooved rifle the most valuable?	2420
What is a talking doll?	812
In what year were shells invented? When did they come into general use?	2610
Who invented the Corliss steam engine?	463
When and where were breech-loading guns first used successfully?	367
Are artificial limbs of modern invention? Of what are they made?	158
Who invented the first modern system of shorthand?	2620
What two men are credited with the invention of movable type?	2313
Where was the first steam railway built in the United States?	2366 2367
When were the first sleeping cars made?	2599
Who invented the chain-stitch sewing machine? Why is it not practical?	2599
For what are slot machines used?	852
Who invented the Colt revolver?	633
What are cable cars? Where are they still used extensively? Who is noted for making marked improvements in the manufacture of steel pens?	426 2145
Who made the first rapid printing press?	2314
When did the automobile come into use?	196
When and by whom was dynamite first made?	314
Who originated the block system of signals? What is the Archimedes screw? For what is it used?	132
Who first made delft pottery ware?	2295
Who patented the first revolver?	2404
When and by whom was the saxhorn invented?	2542
When was the first patent on a fireproof safe issued?	2483 2383
Who invented the cotton gin?	3143
What is a speaking trumpet? Who invented the modern speaking trumpet?	2701
Describe a broadcast seeder	2093 2722
Who made the first steamboat?	2732
When was the first modern steam engine made?	3105 2735
What is a locomotive?	2735
What is a snowplow?	2666
n what countries are snowshoes worn?	2666
n what countries are snowshoes worn?	2740
How does the telescope assist the eye?	2838
Name some of the men who aided in improving the telescope?	2839
Who invented the rotary-field motor?	2849
Who invented the rotary-field motor?	2861

	878
What is conscience? How can it be trained?	657
Define perception. Can it be cultivated?	2150
Distinguish between soul and mind	2678
Do we possess freedom of the will?	3150
Tell how association aids in the acquirement of knowledge	170
Explain the doctrine of egoism. What is altruism?	881
Of what can we be conscious?	658 2588
Can the power of attention be cultivated? How?	181
What is the intellect? How can it be cultivated?	2327
Do we know the constituents of mind or matter?	1793
Explain the theory of unconscious cerebration	523
What is correlation? How can it be utilized in studying?	682
Enumerate the representative and reflective powers of the mind	
Who first employed the term concentration in the study of mind?	645
Is there a close relationship between the body and mind?	2328
Define memory. Can it be trained? If so, how?	2328
Define consciousness. Of what can we be conscious?	
What is the cause of different kinds of dreams?	967
Define feeling. How are the feelings classified?	984
Define feeling. How are the feelings classified?	1369
What ideas are the product of intuition?	1399
Can the reason exercise itself on abstract as well as simple subjects?	2382
What is fancy? At what time is the power of fancy greatest?	975
Distinguish between psychical and corporeal feelings	1476
그림에 가장 하는 사람들이 가면 되는 보는 것이 하면 하는 것이 되었다. 그렇게 되었다면 하는 것이 없는 것이 없는 것이 없다면 하는 것이다.	1410
MINERALOGY	
DEFINITION: Mineralogy is the science which treats of minerals and enables us to scribe and classify them.	de-
Name the principal departments into which mineralogy is divided or classified	1794
What is brass? Mention its principal uses	361
How is potash obtained and for what is it used?	2292
How is salt obtained? Which county produces the largest amount of salt?	2507
What is mineral wool and how is it obtained?	1079
What is onyx? For what was it used by the ancients?	2040
What is plaster of Paris and why is it so named?	
	1225
What are the principal characteristics of metals? Name the more important metals	$\frac{1225}{1766}$
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi?	1225 1766 74
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi?	$\frac{1225}{1766}$
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi? What is asphalt and where was it first found? Tell of its principal uses Name and describe a mineral highly useful for its property of not being affected by fire. For what is it used?	1225 1766 74 167
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527 609
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527 609 670
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527 609 670 985
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527 609 670 985
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi? Name and describe a mineral highly useful for its principal uses Name and describe a mineral highly useful for its property of not being affected by fire. For what is it used? Where is cadmium found and when was it discovered? Name the three forms of carbon. Which is the purest form? Of what is chalk composed? Is chalk still forming? State the constituents of coal and tell how coal was formed What country is the largest producer of copper and what are the uses of that metal? Of what substances is felspar the principal constituent? Where is it mined? What is alum? How is it obtained and for what is it used? To what class of minerals does carnelian belong? For what is it used?	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486
What are the principal characteristics of metals? Name the more important metals	1225 1766 74 167 159 428 479 527 609 670 985
What is alluvium? How much silt is carried annually by the Mississippi? What is asphalt and where was it first found? Tell of its principal uses	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi? Name and describe a mineral highly useful for its principal uses Name and describe a mineral highly useful for its property of not being affected by fire. For what is it used? Where is cadmium found and when was it discovered? Name the three forms of carbon. Which is the purest form? Of what is chalk composed? Is chalk still forming? State the constituents of coal and tell how coal was formed What country is the largest producer of copper and what are the uses of that metal? Of what substances is felspar the principal constituent? Where is it mined? What is alum? How is it obtained and for what is it used? Is bitumen of vegetable origin? Where is it found and for what is it used? To what class of minerals does carnelian belong? For what is it used? How is clay formed? Where is fire clay found? Name the three kinds of coal marketed most extensively and state the constituents of each. In what sections of the country is lignite coal used extensively?	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596
What is alluvium? How much silt is carried annually by the Mississippi? What is asphalt and where was it first found? Tell of its principal uses	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596
What is alluvium? How much silt is carried annually by the Mississippi? What is asphalt and where was it first found? Tell of its principal uses	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596
What are the principal characteristics of metals? Name the more important metals What is alluvium? How much silt is carried annually by the Mississippi? Name and describe a mineral highly useful for its principal uses Name and describe a mineral highly useful for its property of not being affected by fire. For what is it used?	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596 609 609 1014 81 611
What is alluvium? How much silt is carried annually by the Mississippi?	1225 1766 74 167 159 428 479 527 609 985 78 303 486 596 609 609 6101 81 611 1612
What is alluvium? How much silt is carried annually by the Mississippi?	1225 1766 74 167 159 428 479 527 609 985 78 303 486 596 609 1014 81 611 1612 496
What is alluvium? How much silt is carried annually by the Mississippi? What is alphalt and where was it first found? Tell of its principal uses	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596 609 609 1014 81 611 1612 496 1098
What is alluvium? How much silt is carried annually by the Mississippi?	1225 1766 744 167 159 428 479 527 78 303 303 486 596 609 609 1014 81 611 1612 496 496 498 1098 1198 1198 1198 1198 1198 1198 11
What is alluvium? How much silt is carried annually by the Mississippi? What is asphalt and where was it first found? Tell of its principal uses Name and describe a mineral highly useful for its property of not being affected by fire. For what is it used? Where is cadmium found and when was it discovered? Name the three forms of carbon. Which is the purest form? Of what is chalk composed? Is chalk still forming? State the constituents of coal and tell how coal was formed What country is the largest producer of copper and what are the uses of that metal? Of what substances is felspar the principal constituent? Where is it mined? What is alum? How is it obtained and for what is it used? Is bitumen of vegetable origin? Where is it found and for what is it used? How is clay formed? Where is fire clay found? Name the three kinds of coal marketed most extensively and state the constituents of each. In what sections of the country is lignite coal used extensively? Is copper ductile and elastic? Is it a good conductor of heat and electricity? What is flint? Speak of its color, its composition, and its uses. Describe amber and tell of its value and principal uses What is loadstone? What did the ancients think of it? Name the principal mineral deposits of the Cascade Mountains What is garnet? Name the different kinds of garnet and tell where they are found State some of the characteristics of gypsum and enumerate its principal uses. What is n igneous rock? Is it stratified or unstratified? Was iron known to the ancients? What country produces the largest quantity of pig iron?	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596 609 1014 811 1612 496 1098 1225 1364
What is alluvium? How much silt is carried annually by the Mississippi? What is alphalt and where was it first found? Tell of its principal uses	1225 1766 74 167 159 428 479 527 609 670 985 78 303 486 596 609 1014 811 1612 496 1098 1225 1364

What is the national game of Spain? In what parts of America is it popular? Explain the meaning of higher criticism and state how it differs from lower criticism Locate and trace the route of the Panama Canal. What were the Sicilian Vespers and when did they take place? Where is Balmoral Castle? By whom was it built? What is an antipope? How many were there? Who may be termed a critic? What is higher criticism?	706 2093 2627 219 2273 707 1970 2447 340
MUSIC	
DEFINITION: The science and art of tones, or musical sounds, that is, sounds produce uniform and synchronous vibrations.	
What eminent singer is called "The Swedish Nightingale?" Describe the bagpipe, the banjo, the cornet, the harp, the pipe organ	1880 1879 1217 833 573 225 2078 840 2053 2129 2542 2659 2812 3069 401 1880 209 2542 2659 2812 3069 401 1880 1022 2053 1879 26 12 26 833 974 1879 2556 205 1022 873 2052
NATURAL WONDERS	0002
DEFINITION: We may classify the larger and more impressive phenomena of na	ature
among the natural wonders of the universe. To what class of birds does the laughing jackass belong and where is it found? Which is the largest living bird and what is its principal means of safety? Why is it difficult to distinguish between some animals and some plants?	2062 2232 2913 1137 3190 340

Name the parts of a flower	1020
What animals are said to "live on their tails?"	1073
What fishes show a phosphorescent light at night?	1448
In what respects does the goat differ from the sheep?	1155
Name the largest birds of song	1002
Can baboons sit easily in an upright posture?	203
What animals build dams and houses?	256
For what is clover useful?	607
In what bird do the mandibles cross each other?	713
How many arms has a cuttlefish?	732
How many arms has a cuttlefish?	1042
Does the ant-eater have teeth?	110
Give proofs that the bear is a cunning animal	253
How can a fly walk on the ceiling?	1023
Is the flesh of the badger eaten?	209
Do some animals propagate themselves by buds?	395
How many eggs are laid by a single butterfly?	506
What product is valuable only in an immature state?	584 723
How can we distinguish an African from an Asiatic elephant?	898
What is a flying fish? A flying squirrel?	1024
In what respects are toads different than frogs?	2886
Tell of the growth and development of the silkworm	2636
What is mother-of-pearl and for what is it used in manufacturing?	2134
What is an insectivorous plant? Describe the pitcher plant	2224
Name a poisonous snake that is mentioned in ancient history	166
What bird produces a sound that booms like a drum?	303
How many wings has a butterfly?	419
Where is coffee grown most extensively?	580
Where is conce grown most extensively?	714
How does the power of scent aid the crow? Describe the woodpecker. On what do these birds feed?	3170
What fishes kill their prev by electricity?	2297
Describe a sword fish. Where is it found?	2797
Can an auk fly rapidly? For what is it hunted?	185
Name the seven classes into which hirds are divided	000
What insect is used in making scarlet colors?	614
What bird is spoken of as the most perfect of the feathered tribe?	971
Name the different kinds of fins found in fish What is a trumpet flower? Where is it cultivated? Where do we find the tarantula? Is it poisonous?	1000
What is a trumpet nower? Where is it cultivated?	2928
What is a swift and why is it so called?	2010
What is a seal? Name some of the species	2573
Describe the ibis. Does it fly rapidly?	1356
Which is the largest bird of prev native to Europe?	1535
What animal is the largest of the cat family? Is the owl a bird of prey? For what habits is it peculiar?	1599
Is the owl a bird of prey? For what habits is it peculiar?	2070
What fish has barbs in its fins? How many nuts are borne in the prickly sack of the chestnut tree?	506
How many nuts are borne in the prickly sack of the chestnut tree?	551
What does the name daisy mean?	742
What respect does the voice of the male duck differ from that of the female?	837
What tropical bird is noted for its immense beak?	2902
What insects build large, conclike houses?	2012
Where do we find a bird that sews its nest?	2808
Where do we find a bird that sews its nest?	2074
What bird is typical of vainglory? State the reason	2131
What water bird has a large pouch underneath the lower mandible to store food?	2143
In what country does the deoder cedar grow?	515
What insect is associated with the fireplace of the home?	
What kind of a root has the dandelion?	748
What is a prairie dog and why is it remarkable? From what plant is quinine secured and for what is it employed?	2301
Name a herb-eating sea mammal. Where is it found?	2356
Describe a grasshopper. On what do these insects feed?	1190
Describe a grasshopper. On what do these insects feed? How long is a guinea pig? Why are they domesticated? What are vanilla plants and for what are they useful?	1916
What are vanilla plants and for what are they useful?	3020
Dy What methods may strawberries be propagated?	2759
What is seed? Are some plants flowerless?	2579
In what respect do hares differ from rabbits?	1959
What animal can leap fifteen feet?	1488

CLASSIFIED QUESTIONS	3251
What bird has a lyre-shaped tail? Can the muskrat live in water? Describe the octopus. How much do large specimens weigh? Describe the stork. Where does it build its nest? About how many dates grow on a single tree? Name the largest bird of Australia. Do gorillas live in families? Where do they sleep? Where and how do swallows build their nests?. Which bird has the longest legs in proportion to the size of its body? How high and long is a hippopotamus? Compare it in size with the elephant. What birds fly so rapidly as to elude the eye?. What insect holds its fore legs as if folded for prayer? Do peanuts grow in or above the ground? Where are they cultivated? What is a pineapple? How are pineapples propagated? Name the most beautiful and fragrant of flowers. What animal can see as well in the dusk of the evening as in the daytime? Which bird lays a larger egg than any animal now living? What forage plant is widely cultivated in dry localities?	1882 2018 2751 757 913 1167 2784 2745 1304 1337 1699 2132 2218 2450 503 879
NOTED WOMEN	
DEFINITION: The women who are prominently connected with history, literature, discov and the sciences are properly classed in the list of noted women.	eries,
What Indian maiden saved the life of Captain John Smith? What famous painting of Rosa Bonheur was purchased by Cornelius Vanderbilt and placed in the Metropolitan Museum of Art, New York? Tell why Jane Addams, Susan B. Anthony, and Ellen Terry are famous	333 2849 1595 1591 2618 1707 754 3507 2437 1724 902 2528 2635 3097 575 459 2720 3150 2527 1671 385 385
enter Russian territory?	1817 902 600 1283 3147 2754 507 1895 922 1719 1596 2267 2596 1974 333
What was the immediate cause of the Trojan War? Who was the first English bride in the New England colonies? What president was instructed in writing and arithmetic by his wife?	3164 1463

Who was Madame de Stäel-Holstein?	2720 3147 1721
ORTHOGRAPHY	
DEFINITION: Orthography is the division of grammar which treats of letters, sylla and the art of spelling.	bles,
From what sources was the English alphabet derived?	76 3060
interchangeably? Prepare a table to show the sounds of the letter a. (See Key to Pronunciation.) How many distinct sounds has the letter a in the English language?	658
How many sounds has c? Give examples. When is c silent?	2343 3198 4
Is d ever silent? What number does it represent as a Roman numeral?	739 3067 1427
How many sounds has 1 and how is it uttered?	3060 76
Which is the first consonant? How is it pronounced? When has h its distinctive sound? When does ch generally have the sound of k? Illustrate the long and short sounds of i. How is it used as a pronoun? When is k silent? With what letter is it interchangeable in the German?	$\frac{1227}{1355}$
What kind of a consonant does v represent? Explain its value as a numeral How is the letter f formed? Is it an aspirate?	$\frac{3009}{965}$ $\frac{2076}{1}$
How many sounds has o? What is its value in arithmetic? Which letter is the rarest tone? When was it adopted by the English?	1887 2803
Do the alphabets of European people agree? Illustrate the long sound of e. Does it occur frequently in English? Exemplify the two sounds of g. When is it silent? How many sounds has r? What are the three R's? Does x represent a distinct sound? What is its sound at the beginning of a word?	2359 3194
Classify m. What does it denote as a Roman numeral? What effect has the final e upon the preceding vowel? Give two examples to illustrate the two principal sounds of i. What is spelling reform? Give some examples of words that may be changed	852 1355 2704
PENMANSHIP	
DEFINITION: Penmanship is the art of writing, as with a pen or pencil.	
Has the ability to commit thought to writing been an important factor in education? Define phonography and stenography	2620 76 171
Explain and classify the four modes of writing used by the ancient Egyptians	1299 2224 2620 2952 3188
What is cryptography and for what purposes is it employed?	3188 3188 3188
PHYSICS	
DEFINITION: Physics is the science which treats of the laws and properties of matter, investigates the causes that modify the general properties of matter.	and
Define physical science and natural science	2205

What is specific gravity and how is it found?	2702
State the four laws upon which the hydrostatic press depends	351
Explain the theory of the thermometer	2861
Do we know the constituents of mind and matter? If not, how do we study them?	793
Explain the theory of the phonograph and tell of its uses	199
How is a siphon made and what are its uses?	642
Explain the theory of sound. How is a musical sound produced?	2679
Is the temperature of liquids raised after they reach the boiling point?	326
What is an air compressor and for what is it used?	43

PHYSIOLOGY

DEFINITION: Physiology is the science which treats of the functions and properties of living organisms.

nying organisms.	
Which is the lowest and which is the highest form of living beings?	2207
What did Huxley regard as the physical basis of life?	2322
What did Huxley regard as the physical basis of life?	9
What is the function of the kidneys?	1506
Name the hones of the human arm? Of the leg?	1562
How do nails grow and what is their function?	2646
Describe the structure of the spinal cord	1923
Name the three main parts of the brain. Tell of their functions	502
What should be done in a case of fainting?	067
Describe the tongue. What are its functions?	2001
Describe the tongue. What are its functions:	1610
Name the organs of the lymphatic system. In what three principal divisions is physiology classified?	1049
In what three principal divisions is physiology classified:	2200
Could man live on one kind of food? Why?	1070
where is the tendon of Achilles? Why is it so named?	1870
Of how many pairs do the cranial nerves consist? Name them.	1923
Define pulse. Where is it most easily noticeable?	2333
Of what two acts does respiration consist?	2400
What causes the color in hair?	1233
How many bones in the skull? Name them	2648
Of what does the abdomen of insects consist?	5
Why does the body need different kinds of food?	1027
How many bones in the human skeleton? Do some bones become united?	2646
Is milk a nutritious food? Why? How many muscles has the body? Are they in pairs?	1787
How many muscles has the body? Are they in pairs?	1876
What is the function of the nerves?	1922
Of what six approximate substances does living matter of animals consist?	2207
Trace fully the processes that food undergoes in the body.	2208
Name the vital fluids of the body and tell by what organs each is secreted	2207
In what organ is the blood purified? Explain the process.	1646
Into how many cavities is the trunk divided?	5
How many bones in the human hand? Name them.	1246
Where may the pulse be felt and how often does it beat?	2333
Have plants a respiratory process? How do fishes carry on respiration?	2401
What are the principal causes of neuralgia?	1928
Describe the human foot. How many muscles control the motions of the foot?	1028
What are the principal end organs of touch?	2003
Describe the nose. Why is it above the mouth?	2000
Is a bone united again after it is broken: If so, how?	2000
Mention some of the waste products of the body	9000
Mention some of the waste products of the body. 2201, 2109,	190
How is a good appetite stimulated? Describe the blood. What is coagulation?	215
Describe the blood. What is coagulation:	919
Define arachnoid and dura mater	358
Explain the theory of hearing	853
What is the epidermis? In man where is it the thickest?	927
How have the races of mankind been classified by facial angles?	966
Distinguish between vital and animal functions	1078
Describe the venous system. To what diseases are the veins subject?	3026
What is a membrane and what uses does it serve?	
Trace the blood to and from the heart	1275
What is albumen? Why is meat of young animals more tender than that of older ones?	56
Describe the abdomen. How is it lined?	5
What three purposes do bones serve? What is the periosteum?	332
Describe the medulla oblongata and explain its function	358
Name the three parts of the ear	853
What are the cornea, the sclerotic coat, the iris, the optic nerve?	962
Describe the structure of the teeth	2832

CLASSIFIED QUESTIONS	3255
Can the state of intelligence be estimated by the shape of the skull? Describe the skeleton. Name the bones of the pelvis. Name some of the fluids resulting from the process of secretion. Is alcohol a food? Why? What are biceps, striped muscles, fibrillae? What is fatty degeneration? Give its cause. Describe voice and tell how it is produced. What is the "change of voice?" At what temperature is the taste most distinct?. Where are the metacarpal bones and the phalanges? How many bones in the head of man, in the face? Describe the function of the lacteals? Describe the cerebrum and the cerebellum Trace the blood in its circulation through the system What can you say of the form and shape of bones? How many teeth has a youth, an adult? Of what two layers is the skin composed? What are their functions? How do the hairs grow and what purposes do they serve? Define hygiene and speak of its importance. Describe the voluntary and the involuntary muscles.	2646 2578 58 1876 980 3059 2824 2646 1529 523 315 333 2833 2647 1233 1351
POLITICAL SCIENCE	
DEFINITION: Political science treats of public policy and the administration of a stanation.	te or
Write an essay on the leading political parties of the United States Mention the leading political parties of Great Britain	3136 1549 3136 7 294 7779 983 1066 3136 2667 1516 780 1198 2980 1582 2399 425 727 732 2667 780 983 1523 1523 1523 1523 1523 1523 1523 152
POPULATION	
DEFINITION: Population is the whole number of inhabitants of the earth, or any po of the earth, as in a county, city, or country. What is the theory of Malthus in regard to the increase of population and means of subsistence? Is it possible to civilize all the nations? Give a reason for your answer Which province of Canada has the largest population? Which is second in population? 2039, What was the urban population of the United States in 1900? Which of the five races constitutes about one-third of the population of the earth? What State has the greatest wealth and population? When is a nation considered civilized?	2276 589 2350 2276 1826 1958

Why does the female population of Europe exceed that of the males?	2270
Which is the largest city in the world? The largest of Canada?	1840
Which continent has more than half the population of the earth?	165
How many cities of the United States have a population of over 100,000?	2974
What governs largely the migrations of man?	1784
State the Negro population of the United States in 1790: in 1900	1919
What was the male population of the United States in 1900?	2276
What was the male population of the United States in 1900? What was the urban population of the United States in 1790?	2975
Which is the most populous island of the Philippines?	2101
Which is the most populous island of the 1 mingrates.	011
Distinguish between emigrants and immigrants	911
Name the 38 cities of the United States that have more than 100,000 inhabitants	2914
What is the total population of the United States, including the colonies?	2914
Where was the center of population of the United States in 1900?	2276
What is the rank of Philadelphia in population? Of Washington?	2974
Give the population of each State in the Union	2978
What city takes fourth rank in population?	2495
State the Indian population of the United States in 1900	2974
What is the Chinese population of the United States?	2974
What languages are snoken most extensively?	1540
What languages are spoken most extensively?	2276
Who must be Principle of Depulation 2"	2276
Who wrote "Essay on the Principle of Population?" What is the population of Chicago? Of Montreal? Which State of the United States has the smallest population?	1040
What is the population of Chicago? Of Montreal:	1040
Which State of the United States has the smallest population?	2978
What is the population of our colonial possessions?	2914
State the Negro population of South Carolina	2689
What is the total population of Idaho? The Indian population?	1362
How many Japanese are there in the United States?	2974
How many Japanese are there in the United States?	
migration?	2276
migration?	2975
STATESMEN	
DEFINITION: A statesman is one who is prominent for his ability in political affairs	and
for his knowledge of the principles and art of government.	
What eminent Japanese statesman was assassinated by a Corean in 1909?	1494
Name six eminent statemen of Canada 1904 1549 1659 1664 9757	2036
Name six eminent statesmen of Canada	2936
Name six eminent statesmen of Canada	2936 2942
Name six eminent statesmen of Canada	2936 2942 1447
Name six eminent statesmen of Canada	2936 2942 1447 818
Name six eminent statesmen of Canada	2936 2942 1447 818 1242
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710 706 691
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710 706 691
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 694 580 3167
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 694 580 3167 3114
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 706 694 580 3167 3114 2447
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 706 694 580 3167 3114 2447
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 694 580 3167 3114 2447 601
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710 706 694 580 3167 3114 2447 601
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 710 706 694 580 3167 3114 2447 601
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 694 580 3167 3114 601 2160 2384 2384
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 821 1463 812 2863 776 694 580 3167 3114 601 2160 2384 2384
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 1463 812 2863 812 2863 3167 706 694 2447 601 2160 2384 2629 295 295 295 295 295 295 295 295 295 2
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 1463 812 2863 776 694 2447 601 2160 2384 2629 3173
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 1463 812 2863 776 694 580 3167 3114 2447 601 2160 2384 2629 1596 1593 1593 1593 2115 2115 2115 2115 2115 2115 2115 211
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 1463 812 2863 776 694 580 3167 601 2447 601 2160 2384 2629 1596 3173 476
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 821 1463 812 2863 776 694 580 3167 691 2447 601 2160 2384 2629 1596 3173 2456 2598
Name six eminent statesmen of Canada	2936 2942 1447 818 1242 795 1591 1463 812 2863 816 776 694 2447 601 2160 2384 476 3173 1235 476 2598 390
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 1463 812 2863 776 694 3167 3114 2447 601 2160 2384 2629 1596 476 2598 476 2598 3298 3298
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 1463 812 2863 776 694 580 3167 601 2447 601 2160 2384 2629 1596 3173 476 2598 390 2388 391
Name six eminent statesmen of Canada	2936 2942 1447 818 818 1242 795 1591 1463 812 2863 776 694 580 3167 601 2447 601 2160 2384 2629 1596 3173 476 2598 390 2388 391
Name six eminent statesmen of Canada	29362 29422 1447 818 1242 795 1591 1463 812 28633 812 28633 3167 710 706 694 2447 601 2160 2384 2629 11596 2598 3173 1235 476 2598 390 2388 2613 1783 2613 2613 2613 2613 2613 2613 2613 261
Name six eminent statesmen of Canada	29362 29422 1447 818 1242 795 1591 1463 812 28633 8167 706 694 2447 601 2160 2384 2629 11596 3173 1235 476 2598 390 2388 2613 1783 2613 2613 2613 2613 2613 2613 2613 261

CLASSIFIED QUESTIONS	3257
Who was called "Washington of South America?" What was the Thurman Act and who introduced it? Who delivered the dedicatory address at the national cemetery at Gettysburg in 1863? Who was called the "Little Giant?" What statesman first suggested the Erie Canal? Name the presidents and vice presidents of the United States How many men signed the Declaration of Independence? Name a famous American statesman and educator Who is spoken of as the "Father of the United States Military Academy?"	954 820 604 2976 2994
TELEGRAPHY	
DEFINITION: Telegraphy is the art or science of communicating by means of telegrants.	aphic
What is a telegraph and why is it so named?	2836 426 426 2203 1705 2836 2835 2835 2836 2835 2836 1854 2835 2849 1854 2836 2836
UNITED STATES HISTORY	
DEFINITION: The history of the United States embraces the history of the United S and its colonial possessions.	tates
Who were the Pilgrim Fathers? The Puritans?	3056 2256 2192 3147 2978 1378 1530 2049 1553 2602 152 47 1316
When and by whom was New Jersey settled? When was North Dakota made a State? What and where is the capital? When was Oregon made a Territory? When a State? Explain the Monroe doctrine. When and why was it declared? What was the national debt in 1909?	1945 1994 2051 1832 1903
How was New Mexico acquired by the United States? When was Greater New York organized? Of what does it consist? When was Ohio admitted? Name its principal cities Enumerate the principal events of Pierce's administration Where were the Pueblo Indians resident and for what were they noted? Define reconstruction. What was carpetbag government?	1964 2024 2211 2330 2385
When and where was Montcalm slain?	2350

Who influenced the Revolutionists by writing "Common Sense" and "The Crisis?"	2080
What presidents served two terms and which died while in office?	2305
Speak of the assistance rendered the Americans in the Revolution by Count Pulaski	2332
When was Oklahoma made a Territory? A State? What was the Pan-American Congress? When and where was the last one held?	2028
Enumerate the principal events of Polk's administration Tell about Paul Revere. What poem was written on his exploit?	2261
Tell about Paul Revere. What poem was written on his exploit?	2403
When did Roosevelt become President and whom did he succeed?	2447
Speak of the prolonged contest between President Johnson and Congress	1463
Who was the first president of the republic of Texas? What treaty ended the war with Mexico? What were its chief provisions?	1328
Mention and describe the principal colonial possessions of the United States	2004
Explain the Dred Scott decision. By whom was the decision delivered?	8.28
When was West Virginia formed? Why? What was wampum and how was it made?	3130
What was wampum and how was it made?	3079
Name two lakes and three rivers of Utah	3005
Enumerate the causes of the War of 1812	3084
From what states have presidents been chosen? Explain the stamp act and tell why it was objectionable	2976
Who saved the life of Captain Iohn Smith?	2658
Who saved the life of Captain John Smith? With how many men did Sherman make his famous march to the sea?	2614
What controversy was settled by the Ashburton Treaty?	161
With what surrender did the Revolutionary War end?	3209
Who commanded the bombardment of Fort Sumter in 1861?	255
In whose administration did the panic of 1837 occur? Who is the father of the Fourteenth Amendment to the Constitution?	3016
What were the bounty impare?	350
What were the bounty jumpers? What noted statesman and orator was called the "great pacificator? Why? When and how did the United States acquire Guam?	597
When and how did the United States acquire Guam?	1210
Why was America so named? When?	3038
Name some of the direct causes of the Revolution.	2979
Give a list of the vice presidents of the United States	2976
Give a list of the vice presidents of the United States What Confederate general was killed at the Battle of Shiloh? 1465, How many lost their lives in the destruction of the battleship Maine?.	1965
Who is supposed to have discovered America in 1001?	1565
Who is supposed to have discovered America in 1001? What President was a strong supporter of slavery and State sovereignty?	392
When was the Clayton-Bulwer Treaty ratified?	597
What states joined the Confederate States? Who originated the expression "squatter sovereignty?" Give the time and results of the Battle of Gettysburg Name a Governor of the Massachusetts colony. What work did he write?	649
Who originated the expression squatter sovereignty?	1134
Name a Governor of the Massachusetts colony. What work did he write?	3166
What were the causes of the Mexican War and when did it begin?	2980
Name all the presidents of the United States	2076
What is the Tammany Society? What is its membership? In what years have additions been made to the territory of the United States? From what three states have a majority of the presidents been elected? Give the principal events of Jefferson's administration	2812
In what years have additions been made to the territory of the United States?	2982
Give the principal events of Lefferson's administration	1447
Flow long and when was Madison President?	10.4
What were the events of Monroe's administration?	1831
What Spaniard spent four years in exploring the region of Florida and Georgia?	788
What Spaniard spent four years in exploring the region of Florida and Georgia? When did President Lincoln issue the Emancipation Proclamation? When was the flag of the United States originated?	908
When was the flag of the United States originated?	1009
When was Georgia explored by the Spaniards? Who was the presidential candidate against Grant in 1872?	1121
Who saved the day for the Federals at Winchester?	2612
When did many Huguenots come to America?	1334
When and why did Dorr's Rebellion occur?	818
What is the popular name of Florida?	1016
Name an eminent advocate of emancipation	1099
When was Winfield Scott a candidate for President? What was the Crédit Mobilier scandal?	700
When was Santiago captured by the American army?	
Who was President of the Confederate States?	760
Where and by whom was Manila captured?	792
Who was King of Great Britain at the time of the American Revolution?	1117
Give an account of the Hugon Indiana	1429
Give an account of the Huron Indians	1343
When and where was the first settlement made in Indiana?	1380
What was meant by "htty-four-forty" and when was it a political issue?	2051
When were the Pacific railroads built and what legislative scandal resulted from them?	2077
WHEN ON THE DAILE OF WICHTHOUTH OCCUP!	1890

What were the Alabama Claims? Were they paid in full? With whom did Aaron Burr find a home for some time? What is the Burlingame Treaty? When was it concluded? 42 43 44 45 46 47 47 47 47 47 48 48 48 48 48
ZOÖLOGY
DEFINITION: Zoölogy is the department of biology which treats of the animal kingdom, in cluding the structure, embryology, classification, and distribution of animals.
Of what does animal life consist at the beginning?

GENERAL CROSS INDEX

Figures refer to pages in the books. The page on which a title is treated is indicated immediately after the title, and the remaining numbers, if any, designate the pages where additional information is found. A very large number of subjects not treated under special titles are indexed, making the utility of this work quite as extensive as the larger encyclopaedias.

A

A, 1, 1879, 2951. 3065. A1, 1. AA, 1. Aachen. See AIX-LA-CHAPELLE, 44. Aalborg, 1, 1482. Aali Pasha, Mehemed Emin, 1, 2944. Aan Pasna, Mehemed Emin, 1, 2 Aar, 1, 2406, 2793. Aard-vark, 1; ant-eater, 110. Aard-wolf, 1, 32. Aarhus, or Aarhuus, 2, 782, 1482. Aaron, 2, 1455, 1857. Abacus, 2, 434. Abad I., 2. Abalone, 2. Abatis, or Abattis, 2. Abbé de Montigny. See LAVAL-MONTMORENCY, 1550. Abbe, Cleveland, 2722. Abbey, 2; monastery, 1824. Abbey, 2; monastery, 1824. Abbot, 2. Abbot, 2. Abbot, Ezra, 3. Abbot, Henry Larcom, 3. Abbotsford, 3, 2566. Abbotsford Club, 3. Abbott, Charles Conrad, 3. Abbott, Lacob, 3. Abbott, Charles Conrad, 3.
Abbott, Jacob, 3.
Abbott, John Stevens Cabot, 3.
Abbott, Lyman, 3.
Abbreviations, 3, 4, 897.
Abd-el-kadir, 4.
Abdication, 4, 1223, 1416.
Abdomen, 5, 187, 1393.
Abdul-Aziz, 5.
Abdul-Hamid II., 5, 2944.
Abdul-Mediid, 5 Abdul-Medjid, 5. Abd-ur-rahman, 5. A Becket. See Becket, 256. Abel, 6, 17, 431. Abel, Niels Henrik, 66. Abel, Niels Henrik, 66.
Abélard, Peter, 6, 1620.
Abencerrages, 6.
Aben Ezra, Abraham, 6.
Abercrombie, James, 6, 2876.
Abercromby, Ralph, 8, 1977.
Aberdeen, Scotland, 6, 2563.
Aberdeen, S. D., 7, 2691.
Aberdeen, John Campbell Gordon, 7.
Abernathy, John, 7.
Aberration, 7.
Abigail, 7. Abigail, 7. Abijah, 159. Abimelech, King of Gerar, 262. Abington, Mass., 7. Abner, 7.

Abo, Finland, 7, 1000.
Abolitionists, 7, 384, 1099, 2193, 2754.
Abolition of Slavery, 908, 1595, 2651.
Abomey, Dahomey, 8, 741.
Aborigines. See Indians, 1382.
Aboukir, 8, 1395, 1977.
About, Edmond, 8.
Abracadabra, 8 Abracadabra, 8.
Abraham, 8, 1455.
Abraham, Plains of, 470, 3174.
Abrasive, 8.
Abruzzi, Duke of, 8, 135, 2251. Absalom, 8, 759.
Absalom, 8, 759.
Absinth, 9; wormwood, 3184.
Absolution, 9; priest, 2308.
Absolution, 9, 2729, 2730. Absorbents, 9, 1529, 1649, 2648. Absorption, 9, 1649. Abstinence. See Total Abstinence, 2901. Abstraction, 9. Abt, Franz, 9, 1130. Abu-Bekr, 9, 1818. Abu, Mount, 2520. Abu Teman, 9. Abutilon, 9. Abutilon, 9.
Abydos, Asia Minor, 9, 1294.
Abydos, Egypt, 10.
Abyssinia, 10, 33.
Abyssinia, Church of, 2394.
Acacia, 11, 2450.
Academy, 11, 2414.
Acadian, Expulsion of, 11.
Acanthus, 11 Acanthus, 11. Acapulco, Mexico, 12. Accadians, 725. Acceleration, 12, 973 Accent, 12. Acclimation, or Acclimatization, 12. Accordion, 12; concertina, 645. Account, 12. Accum, Friedrich, 13. Accumulator, 13. Acephala, 1822. Acetanilid, 13. Acetate, 13. Acetic Acid, 13, 3050. Acetylene, 13; water gas, 1101. Achaea, 14. Achaean League, 129, 676, 2195. Achaeans, 1195, 2195. Achaia, or Achaea, 129, 2443. Achard, Franz Karl, 14. Achates, 14. Acheen, or Achin. Sumatra, 14 Achelous, 14. Acheron, 14, 540.

Achill, or Eagle Island, 14, 1405. Achilles, 14, 1277, 2765, 2862. Achilles, Tendon of, 15, 1876. Achim, Egypt, 15. Achim, Egypt, 15. Achim, Egypt, 13: carbonic, 479 Acid, 15; acetic, 13; carbonic, 479; citric, 587; nitric, 1979; prussic, 2326; sulphuric, 2773; tartaric, 2821. Acireale, Sicily, 15. Acireale, Sicily, 15.
Ackerman, Amos T., 15, 2993.
Aclinic Line, 15, 929.
Aconcagua, Chili, 15, 98, 2681.
Aconite, 15, 2247, 2578.
Aconitum Napellus, 15.
Acoustics, 15; sound, 2679.
Acre, 16, 136.
Acre, or Akka, Syria, 16, 1356, 1895, 2660.
Acropolis, 16, 175.
Acrostic, 16. Acrostic, 16.
Actaeon, 16.
Actinic Balance, 329.
Actium, Greece, 17, 115, 599. Actinium, (chemistry), 546. Acton, John Emerick Edward Dalberg, 17. Acton Bell, 380. Acts of the Apostles, 17, 288, 1644. Acupuncture 17. Acupuncture 17.
Adam and Eve, 17, 431, 940.
Adams, Mass., 17.
Adams, Charles Francis, 17.
Adams, Charles Francis, 17.
Adams, Charles Kendall, 18.
Adams, G. M., 456.
Adams, Herbert Baxter, 18. Adams, Henry, 18.
Adams, Herbert Baxter, 18.
Adams, John, 18, 2976, 2995.
Adams, John Couch, 2231.
Adams, John Quincy, 19, 2976.
Adams, Maude Kiskadden, 19.
Adams, Samuel, 19, 85, 2995.
Adams, Sarah Flower, 1353.
Adams, William, 19.
Adams, William Taylor, 20, 2327.
Adam's Apple, 1545.
Adam's Needle, 3212.
Adanson, Michael, 228.
Adda River, 20, 643. Adam's Needle, 3212.
Adanson, Michael, 228.
Adda River, 20, 643.
Addams, Jane, 20, 1335.
Addams, Jane, 20, 111.
Adder, 20, 2331, 3052.
Adder's-tongue, 20.
Adderwort, 20.
Addicks, John Edward, 20.
Addicks, John Edward, 20, 11.
Addison, Joseph, 20, 919.
Addition, 141.
Address, Forms of, 21.
Adde, George, 21, 89.
Adelaide, Australia, 21, 2686.
Adeler, Max. See Clark, Charles Heber, 594.
Adelphi College, 21.
Aden, Arabia, 22, 125.
Aden, Gulf of, 22, 124, 2387.
Adhesion 22; cohesion, 620.
Adige River, 22, 24, 1419.
Adipose Tissue, 657.
Adirondack, 22, 119, 1956.
Addective, 29, 2117 Adirondack, 22, 119, 1956. Adirondack, 22, 2117. Adjective, 22, 2117. Adiutant. or Argala, 22, 1703, 2752. Adler, Felix, 22. Admetus, 23, 56. Admiral, 2394.

Admiralty, 23. Admiralty Island, 23. Admiralty Islands, 23, 2264. Admunsen, Roald, 2251. Admunsen, Roald, 2251.
Adobe, 20, 370.
Adonis, 23, 3030; Adonis, 23.
Adrian, Michigan, 24.
Adrian I., 24, 2273.
Adrian III., 24, 2273.
Adrian IV., 24, 2273.
Adrian IV., 24, 2273.
Adrian V., 24, 2274.
Adrian College, 24, 1780.
Adrianople, Turkey, 24, 2943.
Adriatic Sea, 24, 1750.
Adullam, 24. Adullam, 24.
Adullum, Cave of, 24, 758.
Adulteration, 24, 558.
Adventists, 24, 2884.
Adventists, Seventh-Day, 24, 248.
Adverb, 25, 2117.
Advertisements, 1473, 1052. Advertisements, 1473, 1953. Advertisements, 1475, 1955.

Advertising, 25.

Adz, See Ax, 199.

Aecidiomycetes. See Rust, 2477; Smut, 2662.

Aegean Sea, 25, 1191, 1750.

Aegina, Greece, 25.

Aegis, 25.

Aegis, 25. Aegisthus, 34, 608, 2052. Aegospotami, or Patamos, 25. Aemilius Paulus, 462. Aeneas, 25, 797, 3054. Aeneid, 26, 3054. Aeolian Harp, 26; harp, 1255. Aeolian Islands, 26, 1599. Aeolians, 1195, 2862. Aeolipile, 1295. Aeolus, 26. Aeozoic Age, 35. Aëration, 2401; (in plants), 2232. Aërial Ferry, 840. Aërodrome, 1024. Aerodrome, 1024.
Aërodynamics, 26.
Aërolite, 26, 1767.
Aëronautics, 26, 1023.
Aëronautics, 217, 1023, 3187.
Aërostatics, 26; pneumatics, 2242.
Aërostatics, 26; 26. Aeschines, 26, 781. Aeschylus, 27, 1194. Aesculapius, 27, 1351, 1748. Aesculapius, 60, 801, 2180. Aesop, 27, 965.
Aesophagus, 69, 801, 2180.
Aesthetics, 27.
Aetiology, 297.
Aetiology, 297.
Aetna. See Etna, 942, 504.
Aëtius, 3011.
A. F. and A. M. See Freemason, 1062.
Aetolia, Greece, 28.
Affidavit, 28.
Affinity, 28, 1279, 2393.
Affinity, in Chemistry, 28, 22.
Afghanistan, 28, 164.
Afragola, Italy, 29.
Africa, 29, 229, 322, 1327, 1610, 212, 237, 836.
651, 652, 1976, 2109, 2704, 2725.
African. See Negroes, 1918.
African Methodist Church, 33, 1769.
Afrikander, 33, 470. Afrikander, 33, 470. Agamemnon, 33, 2052, 2925. Agaña, Guam, 34, 1210.

Aganippe, 34, 1280.
Agaric, 34; mushroom, 1878.
Agasias, 34, 2569.
Agassiz, Alexander, 34.
Agassiz, Luis, John Rudolph, 34, 84, 3225.
Agassiz, Mount, 34.
Agate, 34, 526, 2346, 2750.
Agathocles, 35.
Agave, 35, 522, 2333.
Age, 35, 381, 734, 928, 1115, 1411, 2749.
Agen, France, 35.
Agent, 35.
Agestiaus, 36, 2700. Agesilaus, 36, 2700. Agincourt, France, 36, 1286. Agnew, Daniel Hayes, 36. Agis and Cleomenes, 2241. Agnosticism, 36, 1157. Agnus Dei, 36; mass, 1726. Agouti, 36, 514. Agra, India, 36, 2809. Agram, Austria-Hungary, 37, 708. Agrarian, 37. Agricola, Cneius Julius, 37, 2805. Agricola, Rudolphus, 37. Agricola, Rudolphus, 37.
Agricultural Education, 37, 873.
Agricultural Experiment Station, 38.
Agricultural Schools, 873.
Agriculture, 38, 977, 3257; department of, 40.
2993; irrigation, 1413.
Agriculture, Department of, 40, 2993.
Agrigentum, Sicily, 40.
Agrimony, 40 Agrigentum, Sicily, 40.
Agrimony, 40, 1434.
Agrippa, 40, 1434.
Agrippa, Heinrich Cornelius, 40.
Agrippa, Marcus Vipsanius, 40.
Agrippina, 596, 1922.
Ague, 41, 1683; fever, 993.
Aguinaldo, Emilio, 41, 1079, 2191.
Agulhas, Cape, 41, 29, 471.
Ahab, 41, 1448, 1456, 1458.
Ahasuerus, 41, 938.
Ahaz, 41, 793, 1416.
Ahaziah, 41, 1448.
Ahriman, 3225.
Ahn, Johann Franz, 41. Ahaziah, 41, 1448.
Ahriman, 3225.
Ahn, Johann Franz, 41.
Aid-de-camp, 41.
Aid-de-camp, 41.
Aimard, Gustave, 41.
Ainmiller, Max Emanuel, 42.
Aino, or Ainu, 42, 1441, 2485.
Ainsworth, William Harrison, 42.
Air, 42, 234, 1600, 2242.
Air Brake, 42, 359.
Air Cells, 43.
Air Compressor, 43.
Air Engine, 42, 43.
Air Gun, 43.
Air-plant, or Epiphyte, 43, 1584.
Air Pump, 44, 2242, 2734.
Air Shaft, 43.
Air Stove, 43; Air Thermometer, 43.
Aisne, 44.
Aix-la-Chapelle, or Aachen, Germany, 44.
Aix-la-Chapelle, Congress of, 44, 1494.
Aix-la-Chapelle, Treaty of, 44.
Ajaccio, Corsica, 45, 1894.
Ajax, 45, 2957.
Akabah, Gulf of, 45.
Akbar, 45, 1377.
A Kempis. See Kempis, 1498.
Akenside, Mark, 45, 3244, 3254.

Akhmim. See ACHMIM, 15.
Akkas, 847, 2338.
Akri, Greece, 17.
Akron, Ohio, 45, 2024.
Alabama, 45, 1020, 2978.
Alabama, The, 47.
Alabama Claims, 47, 1005, 1363, 2585.
Alabama River, 47.
Alabaster, 48, 1225, 2763.
Aladden, 48.
Alameda, Cal., 48.
Alameda, Cal., 48.
Alamo, Tex., 48, 2514.
Aland, 48.
Alcarcón y Mendoza, Don Juan, 48.
Alaric II., 48, 1170, 2444.
Alaric II., 49, 2247.
Alaska, 49, 2598, 2978.
Alaska Fur Company, 1079.
Alaska-Yukon Exposition, 2576. Alaska-Yukon Exposition, 2576. Alatau, 51. Alba Longa, Italy, 51, 2440. Alba Longa, Italy, 51, 2440. Albani, 51. Albania, 51; Scanderbeg, 2545. Albany, N. Y., 51, 1958. Albany, Or., 52, 2051. Albany, or Albion, 52. Albany Convention, 52. Albatross, 52; gull, 1218.
Albatross, 52; gull, 1218.
Albay, Philippines, 53.
Albemarle Sound, 53, 1990.
Albert, Francis Charles, 53, 55, 3045.
Albert, Frederick Augustus, 53.
Albert I of Austria 105. Albert, Frederick Augustus, 53.
Albert I., of Austria, 195.
Alberta, Canada, 53, 458.
Albert Edward. See Edward VII., 878.
Albert Edward Nyanza, 55.
Albert Lea, Minn., 55.
Albert Memorial, 55.
Albert Nyanza, 55, 2725.
Albert Nyanza, 55, 1390.
Albion, 55, 2360.
Albion, Mich., 55.
Albion, Mich., 55.
Alboni, Marietta, 56.
Alboni, Marietta, 56.
Albright, Jacob, 952.
Albright Memorial Library, 2567.
Albumen, 56, 879, 1027. Albumen, 56, 879, 1027.
Albuquerque, New Mexico, 56, 1948.
Alburnum, 56.
Alcaeus, 56, 1194.
Alcamenes, 56. Alcazar, or Moorish Palace, 2597. Alcestis, 56, 23. Alchemy, 56, 545. Alcibiades, 57, 1972, 2062. Alcistrates, King of Cyrene, 118. Alcistrates, King of Cyrene, 116. Alcman, 1194. Alcohol, 57, 261, 804, 3162; koumiss, 1521. Alcohol Lamp, 1010. Alcott, Amos Bronson, 58, 1606. Alcott, Louisa May, 58. Alcuin, or Flaccus Albinus, 58. Alcun, or Flaccus Albinus, 58. Alcyonaria, 58; polyp. 2265. Alden, Henry Mills, 58. Alden, Isabella McDonald, 58. Alden, John, 59, 2242. Alden, William Livingston, 59. Alder, 59; alder buckthorn, 394. Alderman, Edwin Anderson, 59.

Alderney, or Augrigny, Island, 59, 532. Aldershot, England, 59. Aldine Editions, 59. Aldrich, Mary J., 3256. Aldrich, Nelson Wilmarth, 59. Aldrich, Thomas Bailey, 59, 89. Ale, 60, 261. Alemanni, or Allemanni, 60, 538, 1130. Alençon, France, 60. Aleppo, Syria, 60. Alessandria, Italy, 60. Aleutian, 60, 279, 2958, 3077. Alexander. See Severus, 2596. Alexander, A., 3236, 3254. Alderney, or Augrigny, Island, 59, 532. Aleutan, 60, 279, 2958, 3077.
Alexander. See SEVERUS, 2596.
Alexander, A., 3236, 3254.
Alexander I., Pope, 60, 2273.
Alexander VI., Pope, 60, 2274.
Alexander VI., of Scotland, 61, 2564.
Alexander II., of Scotland, 61, 2564.
Alexander III., of Scotland, 61, 2564.
Alexander III., of Russia, 61, 2471.
Alexander He Great, 62, 205, 863, 1165, 1660.
Alexander, of Greece, 62, 1196.
Alexander Nevski, 62.
Alexander Nevski, 62.
Alexandra, Caroline Marie, 63, 878.
Alexandria, Egypt, 63, 62, 883.
Alexandria, Ind., 64; Alexandria, La., 64.
Alexandrian, Va., 64, 3056.
Alexandrian Version (Codex), 64, 2589.
Alexis, of Russia, 2471.
Alexis, Wilibald (1797-1871), 2004.
Alfalfa, or Lucerne, 64, 1269, 1642.
Alfonso, 65.
Alfonso, 1., of Portugal, 65, 2287. Alfonso, 65.
Alfonso I., of Portugal, 65, 2287.
Alfonso X., of Leon and Castile, 65, 2287.
Alfonso XII., of Spain, 65, 2698.
Alfonso XIII., of Spain, 65, 2698.
Alford, Henry, 65.
Alford the Great, 65, 605, 921, 1623. Alfred the Great, 65, 605, 921, 1623. Algae, 65 Algae, 65.
Algebra, 66, 1, 1734.
Algeciras, Spain, 66, 1852.
Alger, Horatio, 66.
Alger, Russell Alexander, 66.
Algeria, 67, 229, 768.
Algiers, Algeria, 68.
Algoa Bay, Africa, 68, 469.
Algonkian, 68.
Algonguins, 68, 305, 551, 776. Algonkian, 68.
Algonquins, 68, 305, 551, 776, 1505, 1730, 1776, 1820, 1898, 2294, 2482.
Alhambra, Spain, 69, 133, 1177.
Ali-Ibn Abu-Talib, 69. Alias, 69. Alicante, Spain, 69.
Alien, 69; citizen, 587.
Alien and Sedition Laws, 69, 983.
Alimentary Canal, 69; digestion, 799.
Alison, Sir Archibald, 69. Alison, Sir Archibald, 69.
Alizarin, 70.
Alimony, 807.
Alkali, 70; ammonia, 90; soda, 2670.
Alkaloid, 70, 613, 2042, 2356.
Allah, 70; Koran, 1519.
Allahabad, India, 70, 1377.
Allan, Sir Hugh, 70.
Allan, Sir William, 70.

Alleghany Mountains, 70, 1904, 2149.
Alleghany Spring, Va., 71.
Allegheny, Pa., 71.
Allegheny Observatory, 71.
Allegheny River, 71, 2150, 2225.
Alleghanger, 71.
Allegheny River, 71, 2150, 2225.
Alleghanger, 71.
Alleghanger, 71.
Allen, Charles Herbert, 71, 2284.
Allen, Charles Herbert, 71, 2284.
Allen, Elizabeth A., 3237.
Allen, Ethan, 71, 2876.
Allen, James Lane, 71.
Allen, Jeremiah M., 72; Allen, William, 72.
Allenby, General E. H., 1106, 1452, 1470.
Allentown Pa., 72, 2151.
Allentown Female College, 72.
Alliance, Ohio, 72.
Alliance, Ohio, 72.
Alliance, Ohio, 73.
Alligator Lizard, 73.
Allison, William Boyd, 73.
Alliteration, 73. Alleghany Mountains, 70, 1904, 2149. Allison, William Boyd, 73.
Alliteration, 73.
Alliteration, 73, 1749.
Allouez, Father Claude, 3169.
Alloway Church, 200
Alloy, 73, 78, 361, 381; in money, 1803.
All Saints' Day, or Allhallows, 74, 1240.
All Souls' Day, 74.
Allspice, or Lamaica, Pepper, 74 All Souls Day, 74.
Allspice, or Jamaica Pepper, 74.
Allston, Washington, 74.
Alluvium, 74; delta, 778.
Alma, Battle of, 74, 705.
Alma River, 74.
Almagest, 126, 173, 2329.
Almagro, Diego de, 74, 2229.
Almanac, 74. See Calendar, 435.
Alma-Tadema, Lawrence, 75. Almanac, 74. See CALENDAR, 455.
Alma-Tadema, Lawrence, 75.
Almond, 75, 2326.
Aloe, 75, 35, 2333, 2449.
Aloes Wood, or Eagle Wood, 75, 1218.
Alpaca, 75, 1612, 2168.
Alpha, Mich., 75.
Alpha, and Omega, 76 Alpaca, 75, 1612, 2168.
Alpena, Mich., 75.
Alpha and Omega, 76.
Alphabet, 76, 658, 3065.
Alphabet Method, 2380.
Alphonso. See Alphonso, 65.
Alpone River, 134.
Alps, 76, 948, 1146, 1760, 2793, 2953; Chamouni, 530; Jungfrau, 1478; Matterhorn, 1735; Saint Bernard Pass, 2488; Saint Gothard Pass, 1169; Stelvio Pass, 2738.
Alsace-Lorraine, Germany, 76, 1128.
Altai Mountains, 77, 164.
Altai Mountains, 77, 164.
Altamaha River, 77, 1120.
Altar, 77, 578.
Altenburg, Germany, 77.
Alto, 77, 2641.
Alton, Ill., 77, 1367.
Altona, Germany, 77.
Altoona, Pa., 78, 2151.
Altorf, or Altdorf, Switzerland, 78.
Altruism, 78, 881.
Alum, 78; burnt alum, 78.
Aluminium, or Aluminum, 78, 546.
Alumnus, 78, 1057.
Alum Shale, or Alum Stone, 78.
Alvarado, Pedro de, 79.
Alverstone, Lord, 79. Alvarado, Pedro de, 79. Alvarado, Pedro de, 79. Alverstone, Lord, 79. Amadeus, of Spain, 5, 79, 2309, 2698. Amadeus I., 79.

Amadeus II., 2530, 2540. Amadeus III., 2540. Amadeus V., 79. Amadeus VII., 79. Amadeus VIII., 79, 2540. Amadis of Gaul, 79, 2439. Amalgam, 79, 1760. Amalgamation, 79, 1766. Amalthea, 25. Amana Community, 79, 642. Amaranth, 79, 1021 Amasia, Turkey, 79. Amati, 80. Amati, 80. Amaziah, 80. Amazirgh, 278. Amazon River, 80, 2052, 2425, 2955. Amazonas, Brazil, 80. Amazons, 80, 205. Amazon Stone, 985. Ambala, or Umballa, India, 81. Ambassador, 81, 1797. Ambato, Ecuador, 81. Amber, 81, 220. Amber, 81, 220.

Amberg, Germany, 81.

Amberno River, 1940.

Amboise, François, 6.

Amboyna, or Amboina, Island, 81, 1823.

Ambrister, Robert, 1382, 1429, 2584.

Ambrose, Saint, Bishop of Milan, 81, 2644.

Ambrosia, 81, 1916.

Ambrosia Beetle, 264.

Ambrosius, Johann, 205.

Ambulacra, or Tube Feet, 864.

Ambulance, 81; hospital, 1326.

Amendment, 82, 2989.

Ament, William Scott, 82.

America, 82, 636; explorations, 211, 214, 427, 495, 530, 636, 683, 788, 1066, 1285, 1468, 1545, 1578, 1673, 1713, 1756, 2268, 3038.

American Association, Advancement of Science, 82. American Beauty, See Rose, 2450. . American Federation of Catholic Societies, 82. American Federation of Labor, 82, 1526. American Forestry Association, 83. Americans Indians. See. Indians, 1382. American Institute, 83. Americanisms, 83. American Legion of Honor, 274.
American Literature, 84.
American Party, 1515, 2259.
American Revolution, 1117, 2404, 2979.
American Coversity, 89, 3092. Americus, Ga., 89. Amerigo, Vespucci. Americus, Ga., 89.
Amerigo, Vespucci. See 3038, 3028.
Ames, Fisher, 89, 85.
Ames, Oakes, 89, 700.
Amesbury, Mass., 89.
Amethyst, 89, 2750.
Amherst, Mass., 89.
Amherst, Nova Scotia, 90.
Amherst College, 90, 1730.
Amicus, Edmundo de, 90.
Amiens, France, 90. See VESPUCCI AMERIGO, Amicus, Edminido de, 90.
Amiens, France, 90.
Ammen, Jacob, 90.
Ammon, 90, 2012, 3220.
Ammonia, 90, 1101, 1261.
Ammunition, 90; cartridge, 495.
Ammonites, 759, 2084, 2359.

Amoeba, 90; protozoa, 2322. Amnesty, 91, 760. Amoor River, 93. Amorites, 91, 451. Amos, 91, 289, 2320. Amoy, China, 91. Ampère, 891, 2962. Ampère, André Marie, 91, 891. Amphibia, 91, 105. Amphictyonic Council, 778. Amphion, 92, 1978. Amphion, 92, 1978.
Amphitheater, or Colosseum, 92, 633, 2440.
Amputation, 92; surgery, 2781.
Amritsar, India, 92; Amsterdam, New York, 92.
Amsterdam, Holland, 92, 1927.
Amu, Amu-Darya, or Oxus, 93, 2073.
Amuck, or Amok, 93.
Amundsen, Roald, 110, 2251.
Amur, or Amoor, River, 93, 2425.
Amurath I., of Turkey, 388, 2943, 3058.
Amurath II., of Turkey, 2545.
Amurath Pasha, 273.
Anabaptists, 93. Amurath Pasha, 273. Anabaptists, 93. Anabasis, 93, 737, 3195. Anaconda, 93, 319. Anaconda, Mont., 93. Anacreon, 93, 492, 2018. Anaemia, 93. Anaesthesia, 2103. Anaesthetics, 93, 571, 613. Anafesto, Pauluccio, 3029. Anagram. 94. Anagram, 94. Anakim, 94, 1137. Anakım, 94, 1137.
Analogy, 94.
Analysis, 94, 1619.
Analytical Geometry, 94, 1116.
Anam, or Annam, Asia, 94, 613.
Ananassa. See Pineapple, 2218.
Anapest, 1028.
Anarchy, 94, 1859.
Anatomy, 95: absorption, 9: alin Anarchy, 94, 1859.

Anatomy, 95; absorption, 9; alimentary canal, 69; aorta, 116; arm, 146; artery, 155; blood, 314; bone, 332; brain, 358; capillaries, 473; ear, 853; epidermis, 927; eye, 961; foot, 1028; hair, 1232; hand, 1246; heart, 1274; kidneys, 1506; lacteals, 1529; liver, 1609; lungs, 1645; lymphatic system, 1649; muscle, 1876; nerves, 1922; nose, 2000; papillae, 2099; respiration, 2400; saliva, 2505; scalp, 2545; skeleton, 2646; skin, 2647; stomach, 2748; teeth, 2832; tongue, 2894; vein, 3025.

Anaxagoras, 95, 1116, 2159.

Anaximander, 96, 2195.

Anaximenes, 96, 2195.

Anchises, 25. Anchises, 25. Anchor, 96. Anchor, 96.
Anchory, 96, 949.
Ancient Order of United Workmen, 96, 274.
Ancona, Italy, 96, 24.
Andalusia, 96, 2631.
Andamans, 97, 275.
Andean Highlands, 2681.
Andersen, Hans Christian, 97, 783.
Andersen, Ind. 97 Andersen, Hans Christian, 97, 783.
Anderson, Ind., 97.
Anderson, S. C., 97.
Anderson, John, 34, 904.
Anderson, Mary. See Navarro, 1909.
Anderson, Rasmus Bjorn, 97.
Anderson, Robert, 97, 2772.
Andersonville, Ga., 98, 239.
Anderson, Nils Johan, 98.
Andes Mountains, 98, 559, 2681.

Andorra, 98, 950. Andover, Mass., 99. Andover Theological Seminary, 99. Andreasy, Julius, 99.
André, John, 99, 995.
Andreae, Johann Valentin, 2452.
Andree, Solomon August, 99. Andrew, 99, 119.
Andrew, John Albion, 99.
Andrew III., of Hungary, 1339.
Andrew III., of Hungary, 1339.
Andrews, Elisha Benjamin, 100.
Andria, Italy, 100.
Andria, Italy, 100.
Andromeda, 499, 2163.
Andromeda, 499, 2163.
Andronicus, Cyrrhestes, 100.
Andros, Sir Edmund, 100, 657.
Andros Island, 100, 734.
Androscoggin River, 100, 1679.
Anemograph, 101.
Anemometer, 101, 3159.
Anemone, 101, 1021; sea anemone, 2572.
Aneroid Barometer, 234.
Angara River, 211, 3206.
Angel, 101, 1082, 1110. Andrew, 99, 119. Aneroid Barometer, 234.
Angara River, 211, 3206.
Angel, 101, 1082, 1110.
Angel, Benjamin Franklin, 101.
Angelico, Fra, 101.
Angell, James Burrill, 101, 618.
Angelo, Michael, 101, 2081, 2570.
Angelus, 102, 1790.
Angelus, Domini, 198.
Angers, France, 102.
Angina Pectoris, or Heart Stroke, 102.
Angle, 102, 1116, 2264.
Angler, 102. Angler, 102. Angles, or Angli, 102, 1482, 2542. Angles, or Angli, 102, 1482, 2542.
Anglesey, or Anglesea, Island, 102, 1409, 1755.
Anglican Church, 103, 922.
Angling, 103; fishery, 1006, 2922.
Anglo-Boer ar, 1901, 3226.
Anglo-Saxons, 103, 429, 920, 2542.
Angola, or Portuguese West Africa, 103.
Angora Goat, 503.
Angora Goat, 103, 1156, 1817.
Angoulême, France, 104.
Angra, Azore Islands, 104, 201.
Anguilla, or Snake, Island, 104.
Angus, Joseph, 104.
Anhalt, Germany, 104, 1128.
Anhydrite, 104. Angus, Joseph, 104.
Anhalt, Germany, 104, 1128.
Anhydrite, 104.
Anicetus, 3012.
Aniline, 104, 277, 610.
Animal, 104, 252, 278, 296, 1687, 1688.
Animalcula. See Protozoa, 2322.
Animal Heat, 105, 296.
Animal Intelligence, 105, 503, 811.
Animal Magnetism, 105, 1764.
Animal Worship. See Ibou, 1363.
Anise, 106, 2025; aniseed, 1600, 2158.
Anjou, Godfrey, Count of, 2231.
Anjou, René, Duke of, 106.
Anna Comnena, 106.
Anna Ivanovna, Empress of Russia, 106, 2471.
Annam, or Anam. See Anam, 94.
Annapolis, Md., 106, 1723.
Annapolis, Nova Scotia, 106.
Ann Arbor, Mich., 107, 1779.
Anne, of England, 107, 922, 2565, 2600.
Annealing, 107; glass, 1149.
Anne Boleyn, of England, 107, 903, 1287.
Annex, Harvard, for Women, 1261. Annihilationist, 107.
Anniston, Ala., 107, 47.
Annitchkoff Palace, 2499.
Annual, 107, 2233.
Annuity, 108; insurance, 1395.
Annunzio, Jabriele d', 108.
Anode, 108, 508, 896.
Anselm, Archbishop of Canterbury, 108.
Ansonia, Conn., 108, 656.
Ant, 108, 110, 2846.
Antaeus, 109.
Antakieh, 113.
Antananarivo, Madagascar, 109, 1669. Antakieh, 113.
Antananarivo, Madagascar, 109, 1669.
Antarctic, 110, 135, 2251.
Antarctic Circle, 110, 3224.
Antarctic Ocean, 110, 2571.
Ant-eater, 110, 1, 869.
Antecedent, 110, 2320.
Antediluvians, 779.
Antelope, 110, 529, 1106, 2716, 2058.
Antennae, 111, 1393.
Anther, 111, 1020.
Antheridium. See Anther, 111.
Anthony, Henry Bowen, 111. Anthony, Henry Bowen, 111.
Anthony, Susan Brownell, 111, 3176.
Anthracite, 111, 609, 1677.
Anthropoid Apes, 116, 2309.
Anthropology, 111, 940. Anthropometry, 111. Anthropometry, 111.
Antichrist, 112.
Anti-corn Tax Legislation, 612, 2140, 2321.
Anti-costi, Island, 112, 2494.
Antidote, 112; poison, 2246.
Antietam River, 112, 1657.
Anti-Federalists, 112, 983.
Antigo, Wis., 112.
Antigone, 113, 2020.
Antigua, Island, 113.
Anti-Imperialists, 2261. Anti-Imperialists, 2261.
Antilles, 113; Leeward Islands, 1562; West Indies, 3126; Windward Islands, 3161:
Anti-Masonic Party, 2257, 2597, 3115, 3167. Antinous, 113, 546. Antinous, 113, 546. Antioch, Syria, 113, 232. Antioch College, 1697. Antiochus, 113. Antiochus, III., 113. Antiope, 80.
Antiope, 80.
Antiope, 80.
Antipater, 781, 2196.
Antiphon, 1194.
Antipodes, 113.
Antipodes Island, 114.
Antipodes Island, 114.
Antipope, 114, 2273.
Antiquaries, Society of, 114.
Antiseptics, 114, 988.
Antislavery. See Abolitionists, 7.
Antithesis, 997.
Antitoxin, 114, 802, 2591.
Ant-lion, 114; dragon fly. 823.
Antofagasta, Chili, 115, 328, 560.
Antonili, Giacomo, 115, 2228.
Antonius, Pius, Titus Aurelius Fulvius, 115.
Antonius, Marcus, 115, 186.
Antonius, Marcus (Mark Antony), 115, 1 Antiope, 80. Antonius, Marcus (Mark Antony), 115, 17, 184, 581, 599. Antrim, Ireland, 265. Antwerp, Belgium, 115, 266. Anubis, or Anepu, 116. Anvil, 116; hammer, 1243. Anvil, or Incus, 854.

Aorta, 116, 488, 1275. Apache, Antonio, 116. Apaches, 116. Apalachee Bay, 1016. Apatite, 116, 1794. Ape, 116, 1137, 1167. Apelles, 116. Apelles, 116.
Apennines, 117, 1419.
Aphelion, 118, 856.
Aphis, 117, 109.
Aphides. See Aphis, 117.
Aphrodite. See Venus, 3030.
Apia, Samoa, 117, 2513.
Apiary, 117; bee, 258.
Apis, 117, 2060.
Apocalypse, 117, 288.
Apocalyptic Number, 117.
Apocrypha, 118, 289.
Apogee, 118. Apoctypina, 118, 289. Apogee, 118. Apollo, 118, 2196, 2341. Apollo Belvidere, 118, 3023. Apollonius of Tyana, 118. Apollonius of Tyre, 118. Apostate, 1476. Apostles, 119, 1434, 1461, 1735, 2125, 2172, 2866. Apostles' Creed, 700. Apostles' Islands, 119, 2780. Apostolic Fathers, 119, 1364. Apostolic Succession, 119. Apostone Succession, 119.
Apostrophe, 997.
Apothecaries' Weight, 119, 3117.
Apothecary, 119.
Appalachian Mountains, 119, 70, 319, 724, 1987. Appalachicola, Fla., 120.
Appalachicola, or Apalachicola, River, 120, 1016.
Appeal, 120; courts, 690.
Appendicitis, 120, 3032.
Apperception, 120, 1290. Appetite, 120.
Appianus, Greek historian, 2085.
Appian Way, 120, 2441.
Appius, Claudius Crassus, 120.
Apple, 120, 121, 581, 2009.
Apple-jack, 360, 581.
Apple of Discord, 121.
Appleton, Wis., 121, 3169.
Appleton Collegiate Institute, 121.
Appleton, Daniel, 121.
Appleton, Daniel Sidney, 121.
Appletone Borer, 122.
Appiel, 122, 2240, 2449.
April See Month, 1839.
April Fools' Day, 122.
Apse, 122. Appetite, 120. Apse, 122. Apsides, 122. Apsides, 122.
Apsidoles, 122.
Apteryx, 122; ostrich, 2062.
Aquarium, 122, 1960.
Aquarius, or Water-Bearer, 123, 3223.
Aquatic Animals, 123.
Aquatic Plants, 123.
Aqueduct, 123, 1963.
Aqueous Humor, 124, 961.
Aquila, Italy, 124.
Aquinas, Saint Thomas, 124.
Arabesque, 124. Arabesque, 124.
Arabia, 124, 70, 165, 202.
Arabian Literature, 125.
Arabian Nights' Entertainments, 126, 48.
Arabian Sea, 126, 162.

Arabi Pasha, Ahmed, 126. Arabs, 125, 202. Aracan Pagoda, 1691. Arachnoid, 358, 2709. Arachnida, 126. Arachnida, 126.
Arad, Hungary, 126.
Arafat, Mount, 126.
Arafura Sea, 154.
Arago, Dominique François, 127.
Aragon, 127, 987, 2697.
Araguay, Grande, or Araguayá, River, 127, 2888.
Aral Lake, 127, 162.
Aram, Eugene, 127.
Aramaic, 127, 2811.
Arapahoes, 127, 632.
Ararat, Mountain, 127, 147, 1981.
Araucania, Chile, 127.
Araucaria, 128.
Arbela, Assyria, 128, 248. Araucaria, 128.
Arbela, Assyria, 128, 248.
Arbitration, 128, 644.
Arbitration, 128, 644.
Arbogastes, 2859, 3011.
Arbor Day, 129, 1855.
Arbor Vitae, 129, 377.
Arbuthnot, Alexander, 1382, 1429, 2584.
Arbutus, 129.
Arcade, 129.
Arcadia, 129, 2144.
Arcae Palm, 285.
Arc de Triomphe, 130, 2106.
Arch, 130, 274, 637, 3024.
Archaean Age, 130, 1115.
Archaeology, 130, 862, 884, 1569, 1573, 1861, 3159. Archaeology, 130, 602, 664, 1309, 1373, 1861, 3159.

Archaeopteryx 130, 1115.

Archangel, 131, 101, 198.

Archangel, or Arkhangelsk, Russia, 131.

Archbald, 131.

Archbishop, 131, 300.

Archelaus, Greek General, 131.

Archer Fish, 131.

Archery, 131; arrow, 154.

Archimandrites, 2.

Archimedes, 131, 64, 1194.

Archimedes' Screw, 132.

Archipelago, 132.

Architecture, 132, 130, 422, 612, 735, 814, 818, 1169, 1400, 1620, 2464 3024 3185.

Arch Ariumphal, 134, 130.

Arc Light, 134, 893, 1010.

Arcole, Italy, 134.

Arcos de la Frontera, Spain, 135.

Arcot, 604.

Arcot, Siege of, 604.

Arcot, Siege of, 604. 3159. Arcot, 604. Arcot, Siege of, 604. Arctic, 135. Arctic Circle, 135, 856. Arctic Expeditions, 135, 665, 1197, 1237, 1270, 1487, 1657, 1890, 2114, 2134, 2363, 2452 2558. Arctic Ocean, 135, 2571. Arcturus, 136. Ardmore, Okla., 136. Ardmore, Okla., 136.
Are, 136.
Arecibo, Porto Rico, 136.
Arena, 136, 1146.
Arendal, Norway, 136.
Areolar Tissue, 517, 657.
Areopagus, or Mars Hill, 136, 176.
Arequipa, Peru, 136.
Arezzo, Italy, 136.
Argall, Samuel, 11.
Argand, Aimé, 136, 1536.
Argand Lamp, 136.

Argelander, Freidrich, 136, 2729. Argelander, Freidrich, 136, 2729.
Argensola, Bartolomé Leonardo de, 136.
Argenteuil, France, 6.
Argentina, 136, 361, 2120.
Argentine, Kan., 138.
Argo, The, 138.
Argon, 138, 546.
Argonauts, 138, 1160, 1443, 1822.
Argonautic Expedition, 1160.
Argos, Greece, 139, 1291.
Argus, 139. Argus, 139.
Argus, 139.
Argul, or Argyle, Campbells of, 139.
Ariadne, 139, 1803, 2862.
Arians, 175; Arianism, 242.
Arid Region, 139; irrigation, 1413.
Aries, 139, 2575, 3223.
Arilo, 2579.
Arinos River, 2816 Arinos River, 2816. Arion, 139. Arion, 169.
Ariosto, Ludovico, 139, 1422, 1531.
Arista, Mariano, 140, 2090.
Aristarchus, 1194.
Aristides, 140, 2858.
Aristippus, 140, 2670.
Aristocracy, 140: government, 1172 Aristoppus, 140, 2670.
Aristocracy, 140; government, 1172.
Aristophanes, 140, 825.
Aristotle, 140, 875, 1194, 1619.
Arithmetic, 141, 1734.
Arithmetical Signs, 141.
Arizona, 142, 2978.
Arizona, University of, 143.
Ariish River, 143. Arizona, University of, 143.
Arjish River, 143.
Ark, Noah's, 143, 1981.
Ark of the Covenant, 143, 2803.
Arkansas, 143, 1020, 2978.
Arkansas City, 145.
Arkansas City, 145.
Arkansas River, 145, 2457, 2966.
Arkwright, Richard, 145, 687.
Arlberg, mountain pass, 146.
Arlington, Mass., 146. Arlington, Mass., 146. Arlington, Va., 146. Arm, 146; bones of, 2646. Armada, or Invincible Armada, 146, 248, 904, 2186 2186.
Armadillo, 146, 869, 1154.
Armature, 147, 850, 897.
Armenia, 147, 2165.
Armenius, William, 1130.
Armies. See Army, 149.
Arminius, 148, 185, 2444.
Armistice, 148.
Armor, 148, 723, 1282.
Armor Plate, 148, 1911, 3087.
Armour, Jean, 413. Armor, 148, 123, 1262.
Armor Plate, 148, 1911, 3087.
Armour, Jean, 413.
Armour, Philip Danforth, 148.
Armour Institute, 554, 1221.
Arms, 149; air gun, 43; artillery, 158; cannon, 463; catapult, 504; gun, 1218; revolver, 2404; rifle, 2420.
Armstrong, John, 149, 1936.
Armstrong, John, 3252.
Armstrong, Samuel Chapman, 149.
Armstrong, William George, 149.
Army, 149; ambulance, 81; legion, 1563; phalanx, 2179; relative rank, 2394; Sepoy, 2588; uhlans, 2956; uniform, 2961; zouaves, 3225.
Army Worm, 151; worms, 3184.
Arnauld, Antoine, 151.
Arndt, Ernst Moritz, 151.
Arnhem, or Arnheim, Holland, 151. Arnhem, or Arnheim, Holland, 151.

Arnica, 152. Arnim, Bettina von, 152, 3246. Arnim, Harry Karl Kurt Eduard von, 152. Arnini, Ludwig Joachim von, 152.
Arnon River, 152, 1419.
Arnold, Benedict, 152, 99, 2054.
Arnold, Sir Edwin, 152.
Arnold, George, 3247.
Arnold, Mother, 152, 920 Arnold, George, 3247.
Arnold, Matthew, 153, 920.
Arnold, Thomas, 153, 2460.
Aroma, 153; spices, 2707.
Aromatics, 153; oils, 2025.
Arpad, 153, 265, 1339.
Arrah, India, 153.
Arran, Island, 153.
Arran, Island, 153.
Arran, 153.
Arran, 926 Arrian, 926. Arrondissements, 266, 1046, 2007. Arrow, 154, 351, 1382. Arrow, 154, 351, 1382.
Arrowroot, 154.
Arrowroot, 154.
Arrowroot, 154.
Arrowroot, 154.
Arsenic, 154; ammunition, 90.
Arsenic, 154; crime, 704.
Art, 154; architecture, 132; engraving, 923; literature, 1602; music, 1879; painting, 2080; printing, 2313; sculpture, 2568; wood engraving, 3178; writing, 3188.
Arta, Gulf of, 17.
Artaxerxes, Longimanus, 155, 2165.
Artaxerxes, Mnemon, 155, 93.
Artaxerxes, Ochus, 155.
Artemis, 155, 794.
Artemis Ward, 155, 2327.
Artery, 155, 315, 1646.
Artesian Well, 155, 2686, 2715.
Artevelde, Jacob van, 156.
Artevelde, Philip, 156.
Arthur, Sels, 1871, 1870; Pitti Palace, 1015;
Vatican, 3023; Versailles, 3036; Vienna, 3046.
Arthropoda, or Articulata, 156, 126.
Arthur, King of Britons, 156, 1176, 2439.
Arthur, Chester Alan, 157, 2976.
Arthur, Julia, 157.
Article, 157, 2117. Arrowroot, 154. Arthur's Seat, 157, 870.
Artichoke, 157.
Artichoke, 157.
Articles, 157, 2117.
Articles, The Thirty-Nine, 157, 922.
Articles of Confederation, 158, 2980.
Articulates, 105.
Artificial Ice. See Ice, 1357.
Artificial Limbs, 158.
Artificial Limbs, 158.
Artillery, 158, 247; army, 149; cannon, 463; tactics, 2806.
Artillery Schools, 159, 1037.
Artois, Count d', 537.
Arundel, Thomas, 159.
Aruwimi River, 159.
Aryan Language, 1385, 1540. Aryan Language, 1385, 1540. Aryans, 159, 1377, 1385. As, or Libra, 159, 781. Asa, 159, 200. Asafetida, 159, 1218. Asaph, 159 Asbestos, 159, 993. Asbjörnsen, Peter Christen, 160. Asbury, Francis, 160.
Asbury Park, N. J., 160.
Ascalon, or Askalon, 160; battle of, 160, 1157. Ascanius, 1547.

Ascension Day, 160, 2435. Ascension Island, 160. Ascham, Roger, 160, 904, 919. Aschbach, Joseph von, 161. Asgard, 2019. Ash, 161, 1698. Ashantee, or Ashanti, 161, 1523. Ashburton, Alexander Baring, 161, 498 Ashburton Treaty, 161, 1681, 2949, 3114. Ashburton Treaty, 161, 1681, 2949, 3114. Ashdod, 740, 2192. Asheville, N. C., 161, 1992. Asheville College, 161. Ashkelon. See Ascalon, 160. Ashland, Ky., 161. Ashland, Ohio, 161. Ashland, Or., 161. Ashland, Pa., 162. Ashland, Wis., 162, 3169. Ashmead-Bartlett, William Lehman, 407. Ashtabula, Ohio, 162. Ashton-under-Lyne, England, 162. Ashtabula, Ohio, 162.
Ashton-under-Lyne, England, 162.
Ash Wednesday, 162, 1569.
Asia, 162, 946, 2076, 2262, 2625.
Asia Minor, 166; Abydos. 9; Lydia, 1649;
Phrygia, 2204; Pisidia, 2222; Pontus, 2270;
Seleucia, 2581.
Asp. 166, 599, 3052.
Asparagus, 166, 2673 Asp, 106, 599, 5052. Asparagus, 166, 2673. Aspasia, 167. Aspen, 167, 1021, 2274. Aspent, Battle of, 1731. Asphalt, 167, 303, 2223. Asphalt, 101, 303, 2223. Asphodel, 167. Asphyxia, 167, 235, 480. Aspirwall, or Colón. See Colón, 628. Aspirate. See Voice, 3059. Aspro Potamo, 14. Aspro Potamo, 14.
Asquith, Herbert Henry, 167.
Ass, 167, 851, 2960.
Assam, British India, 168.
Assassination, 168, 1975.
Assassins, 168, 338, 738, 1217, 1335.
Assault and Battery, 168, 2899.
Assault and Battery, 169, 2049.
Assembly, 169, 1564.
Asshur, 170.
Assimilation, 169; absorption, 9, 200 Assimilation, 169; absorption, 9, 2009. Assimiboia, Dominion of Canada, 169, 55, 458, Assiniboin Indians, 169, 2642. Assiniboine River, 169, 1695. Assisi, Don Francisco, 1416. Assisi, Italy, 169. Associated Press, 169, 1474. Association, 170. Association, 170.
Assuan, Egypt, 170, 745.
Assumption (in logic), 972.
Assurbanipal, 171, 1978, 2782.
Assus, or Assos, Asia Minor, 170.
Assyria, 170; capital of, 1978; conquest of Israel, 1456; cuneiform writings, 725; libraries, 1582; Median conquest, 1747; sculpture, 2569 sculpture 2569. Assyrian Literature, 725. Assyrian Literature, 725.
Assyrians, 170; colonists, 1456.
Aster, 171, 1708, 2779.
Asteroid, or Planetoid, 171, 2671.
Asthma, 172.
Astigmatism, 172; eve, 961.
Astor, John Jacob, 172, 1961, 2051.
Astor, William Waldorf, 172.
Astor Library, 172, 1584.

Astoria, Or., 172, 2051. Astraeus, 186. Astrate (deity), 2198. Astrakhan, Russia, 172, 2470. Astringent, 172, 304. Astrology, 172. Astrology, 172.
Astrology, 172.
Astronomy, 172; aberration, 7; acceleration, 12; apogee, 118; asteroid, 171; comet, 638; constellations, 660; corona, 681; eclipse, 865; equinox, 929; meteors, 1767; milky way, 1788; moon, 1842; nebula, 1915; observatory, 2015; planets, 2231; quadrant, 2343; satellite, 2534; season, 2575; solar system, 2671; stars, 2728; sun, 2776; telescope, 2838; transit, 2910; zodiac, 3223.
Astruc, Jean, 707.
Astyages, 737, 1747.
Asuncion, Paraguay, 174, 2103.
Atacama, South America, 174, 559.
Atalanta, 174.
Atbara River, 10.
Atchafalaya River, 174, 1634.
Atchiana, Kan., 175, 1490.
Athabasca, Dominion of Canada, 175, 55, 458, 2534. 2534. Athabasca Lake, 175, 53, 452. Athabasca, or Elk, River, 175, 53. Athabascan Indians, 1908. Athaliah, 175, 41. Athanasian Creed, 701. Athanaric, 3011. Athanaric, 3011.
Athanasius, Saint, 175.
Atheism, 175, 1157; Voltaire, 3062.
Athelstan, 175, 2559, 2563, 3072.
Athene. See Minerva, 1795.
Athens, Ga., 175.
Athens, Greece, 175, 777, 1193, 2673; Ecclesia, 862; Draco's code, 823; Pericles, age of, 2159; Solon's laws, 2674; Parthenon, 2116; Piraeus, 2221; theater, 2855.
Athletics, 176, 240, 1028, 1224.
Athol, Mass., 177.
Athos, 177; Mount Athos, 177.
Atkinson, Edward, 177. Atkinson, Edward, Atlanta, Ga., 177, 2614.
Atlantic, Iowa, 178.
Atlantic Cable, 178, 426, 994.
Atlantic City, N. J., 178, 1945.
Atlantic Ocean, 178, 2571.
Atlantic Slope, 2965; Atlantic coast plain, 2230. Atlantic Slope, 2965; Atlantic coast pla Atlantis, 179.
Atlas, 179, 2237.
Atlas Mountains, Africa, 179, 31, 67.
Atmosphere, 179, 42, 234.
Atolls. See Coral, 672.
Atomic Theory, 180, 744.
Atomic Theory, 180, 744.
Atomic Weights, 180.
Atonement, 180, 1300, 2145, 2481.
Atrato River, 180, 626, 753.
Atrophy, 180, 1609.
Atropos, 980.
Attachment, 180; garnishment, 1098.
Attainder, 181, 2986.
Attalus, 49.
Attar, 181, 2450. Attart, 181, 2450. Attart, 181, 2328. Attica, Greece, 181, 322. Atticus, Titus Pomponius, 181. Attila, 181, 1340, 2444.

Attleboro, Mass., 182. Attorney, 689, 1480, 2402. Atwater, L. W., 3235. Atwater, W. O., 38. Atzcapotzalco, 3196. Aubanel, Theodore, 1048. Auber, Daniel François Esprit, 182. Auburn, Me., 182. Auburn, N. Y., 182. Auburn System, 182, 2316. Auckland, New Zealand, 182, 1966. Auckland Islands, 182, 1965. Auditorium, 554. Audubon, John James, 183, 1239; parks, 183. 1950. Auer, Aiois, 183. Auerbach, Berthold, 183. Augeas, 183, 1291. Auger, 183, 341. Augsburg, Germany, 183. Augsburg Confession, 183, 701, 1647, 1751. Augsbury Seminary, 1798. Augur, 2442. Augurs, College of 2260 Auer, Alois, 183. Augurs, College of, 2269. August, 183, 1839. Augusta, Ga., 184, 1121. Augusta, Me., 184, 308. Augustan Age, 185, 2444. Augustine, or Austin, Archbishop, 184. Augustine, Aurelius Augustinus, Saint, 184. Augustine, Aurelius Augustinus, Saint, 184. Augustinians, 1756. Augustulus, Romulus, 184, 2444. Augustus, Caius Julius Caesar Octavianus, 184. 17, 1321, 1573, 2444, 2874. Augustus I., Frederick, 185, 2543. Augustus II., Frederick, 185, 2543. Auk, 185, 1215, 2331. Aumale, Duke of, 4. Aurelian, Lucius Domitius Aurelianus, 185, 3219. 3219.Aurelius, Antoninus Marcus, 186, 2444. Aurocla, 1240. Aurochs, or European Bison, 302. Aurora, 186, 1754. Aurora, Ill., 186, 1367. Aurora, Mo., 186. Aurora Australis, 186. Aurora Borealis, or Northern Lights, 186. Aurungzebe, 186, 2602. Ausari, 2165. Auscultation 187 Aureola, 1240. 187. Auscultation, 187. Ausgleich, 195, 196. Austen, Jane, 187. Austen, Jane, 187.
Austerlitz, Moravia, 187, 283, 1895.
Austin, Minn., 187.
Austin, Tex., 187, 2853.
Austin, Alfred, 187, 1548.
Austin, John, 187.
Austin, Stephen Fuller, 188, 187.
Australasia, 188, 109, 2016.
Australia, 188, 2264, 2608, 2822; animals of, 190; gold fields, 1160; wheat production, 191. Australia, 188, 2264, 2608, 2822; animals of, 190; gold fields, 1160; wheat production, 191, 3133 Australia, Commonwealth of, 191; government, 192. Australian Ballot 193, 888, 3064. Australian Kalong, 245. Austria-Hungary, or Austro-Hungarian Empire, 193, 986, 1131, 1338, 1494, 1895, 1896; alliances, 2343; Bohemia, 323; Bosnia, 342;

Dalmatia, 744; Hapsburg, 1250; Poland,

2247; railroads, 2868; Silesia, 2634; Transylvania, 2912; Vienna, 3046. Austrian Netherlands, 1011. Austrian Succession, War of, 1117, 1707. Autonomy, 196, Autonomy, 197, Autono Autonomy, 197. Autoplasty, 198; surgery, 278i. Autumn, 198, 2575. Auvergne, France, 198. Ava, Burma, 198; Ava (chief), 411. Avalanche, 198; landslide, 1538. Avatar, 3057. Aventine Hill, 2441. Ave Maria, 198, 252. Average, 198. Avernus, 198. Avesta, or Zend-Avesta, 199, 2114. Aviary, 199; birds, 297. Avicenna, or Ibn-Sina, 199. Avignon, France, 199, 3000. Avoirdupois, 199, 3117. Avon, 199; in England, 2757. Avoset, or Avocet, 199. Ax, 199; hatchet, 199. Ax, 199; hatchet, 199. Axils, 395. Axiochus, 167. Axioms, 199. Axis, 200; pole, 2252. Axle, 3134, 3135. Ayacucho, Peru, 200. Aye-Aye, 200; lemur, 1569. Ayesha, 1818. Aylesworth, Barton, O., 825. Ayr. Scotland, 200. Ayr, Scotland, 200. Azalea, 200; heath, 1275. Azariah, 200. Azoic. See Archaean, 130. Azores, Islands, 200, 2285, 2846. Azov, or Azof, Sea, 201, 306, 2807. Aztecs, 201, 1382, 1772, 1775. Azurite, 201, 670. Azymites, 201.

B

B, 202, 1879, 2951.
Baader, Franz Xaver von, 202.
Baal, or Bel, 202, 1450; Baalgad, 202.
Baalbek, Syria, 202.
Babbage, Charles, 434.
Babbitt Metal, 202.
Babel, Tower of, 202, 203.
Bab-el-Mandeb, 202, 2160, 2387.
Babenberg, House of, 195.
Babington, Anthony, 202.
Babirussa, or Babyrussa, 203.
Baboon, 203, 1692.
Babylon, 203; hanging gardens, 1247, 2584.
Babylonia, 204, 170, 737, 1294; Nimrod, 1978.
Babylonish Captivity, 205, 1456.
Baccalaureate, 205.
Bacchus, 205, 1725, 2057.
Bach, Johann Sebastian, 205, 1130, 1879.
Bache, Alexander Dallas, 205, 611.
Bacheller, Irving, 206.
Bachelor, 206, 773, 1732.
Bachelor's Button, 2375.

Bacillus. See BACTERIOLOGY, 207. Backgammon, 206. Bacon, 206, 1745. Bacon, Augustus Octavius, 206. Bacon, Francis, 206, 919. Bacon, Josephine Daskam, 207.
Bacon, Leonard, 207.
Bacon, Nathaniel, 207.
Bacon, Roger, 207.
Bacon's Rebellion. See Bacon, Nathaniel, Bacteria, 207; tubercle bacillus, 1517, 2930. Bacteriology, 207, 1517. Bactria, or Bactriana, Asia, 208. Bactria, or Bactriana, Asia, 208.
Badajoz, Spain, 208.
Baden, Austria, 208.
Baden, or Baden-Baden, Germany, 208, 247.
Baden, Grand Duchy of, 208, 305, 2783.
Baden-Powell, Sir George, 209, 762, 2680.
Badge, 209, 1177.
Badger, 209, 1154, 2376.
Badger State, 209, 3167.
Bad Lands, North America, 209, 2690.
Baer, Karl Ernst von, 910.
Baffin, William, 209, 210, 2248.
Baffin Bay, 210, 451.
Baffin Land, 210, 1055, 1987.
Bagatelle, 210. Bagatelle, 210. Bagdad, or Baghdad, Asiatic Turkey, 210, 2943. Bagehot, Walter, 210. Baggesen, Jens, 783. Bagley, Worth, 481. Bagpipe, 210, 2209. Bahama, Islands, 210, 636, 2944. Babia, or São Salvador, Berril, 211, 224. Bahama, Islands, 210, 636, 2944.
Bahia, or São Salvador, Brazil, 211, 364.
Bahia Honda, Cuba, 211.
Bahr, Herman, 211.
Bahram, Khan, 45.
Baiae, or Baja, Italy, 211; Lake Baiae, 198.
Baikal, Lake, 211, 3206.
Bailey, Gamaliel, 809.
Bailey, James Montgomery, 211.
Bailey, Joseph, 211.
Bailey, Joseph Weldon, 211.
Bailey, Joseph Weldon, 211.
Bailey, Philip James, 212, 3241, 3252.
Bain, Alexander, 212, 2588.
Bainbridge, William, 212, 661, 682.
Baird, Spencer Fullerton, 212, 2661.
Baireuth, or Bayreuth, Germany, 212, 2416.
Baker, I. O., 647; Baker, Mount, 496.
Baker, Newton Diehl, 212.
Baker, Sir Samuel White, 212, 55.
Baker City, Or., 212.
Baker, City, Or., 212.
Baking, 213, 365.
Baking Powder, 213, 3203.
Baku, Russia, 213, 498.
Balaam, 213.
Balak, 213. Bahia, or São Salvador, Brazil, 211, 364. Baku, Russia, 213, 498.
Balaam, 213.
Balak, 213.
Balaklava, Russia, 213, 705.
Balance, 213, 3117.
Balance of Power, 214, 705.
Balard, Antoine Jerome, 380.
Balaton, or Platten, Lake, 214.
Balboa, Vasco Nuñez de, 214, 2077.
Balder, 214, 1279, 1620.
Baldwin, I., of Jerusalem, 214, 716.
Baldwin, II., of Jerusalem, 214.
Baldwin III., of Jerusalem, 214.
Baldwin IV., of Jerusalem, 214.
Baldwin V., of Jerusalem, 214.
Baldwin, Abraham, 2989.

Baldwin, Charles H., 214.
Baldwin, James Mark, 214.
Baldwin, Matthias William, 214, 3143.
Bâle, or Basel, Switzerland, 241, 2795.
Balearic Islands, 214, 1682.
Balcen Whale, 3131, 3132.
Balfe, Michael William, 215.
Balfour, Arthur James, 215, 450, 920.
Balfour, John Hutton, 215.
Bali, Island, 215, 1620.
Baliol, John de, 215, 877, 2564.
Balize. See Belize, 267.
Balkan Mountains, 215, 76, 400.
Balkan Free States, 215.
Balkan War, 24, 1196, 1837, 2593, 3280.
Balkh, Afghanistan, 215. Balkh, Afghanistan, 215. Balkhash, or Balkash, Lake, 215, 2625. Ball, 216, 240, 242, 1529. Ball, Thomas, 216. Ball, Thomas, 216.
Ballad, 216, minnesingers, 1799.
Ball and Socket Joints, 1467.
Ballantyne, James, 216.
Ballantyne, James Robert, 216.
Ballantyne, Robert Michael, 216.
Ballarat, Victoria, 216, 191.
Ballast, 216, 2367.
Ballet, 216, 748.
Balloon, 216, 235, 1023, 2101.
Balloon Fish, 218.
Ballot, 218, 193.
Ball's Bluff, Va., 218, 212.
Balm, 218. Balm, 218.

Balmaceda, José Manuel, 219, 561, 3014.

Balm of Gilead, 219, 1001.

Balmoral Castle, 219.

Balsam, 219; copaiba, 668.

Balsam, 219.

Baltic, Battle of the, 219.

Baltic Provinces, 219, 2474.

Baltic Sea, 219, 1995.

Baltimore, Md., 220, 1462, 2074.

Baltimore, George Calvert, Lord, 221, 1728

Baltimore Oriole, 221; Baltimore bird, 2054.

Baluchistan, Asia, 222, 165.

Baluster, or Banister, 222.

Balzac, Honoré de, 222, 1048.

Bamberg, Germany, 222.

Bamboo, 222, 564.

Banana, 223, 2232.

Banana, Congo, 223.

Banca, or Banka, Island, 223. Balm, 218. Banca, congo, 223.
Banca, or Banka, Island, 223.
Bancroft, George, 223, 88.
Bancroft, Hubert Howe, 224.
Bancroft, Marie Effie Wilton, 224.
Banda, 1823. Banda, 1823.
Bandage, 224; styptic, 2765.
Banda Isles, 224.
Bandicoot, 224; rat, 2376.
Bandit, 224; robbery, 2427.
Baneberry, 224.
Banff, Alberta, 224.
Banff, Alberta, 224. Banff, Alberta, 224.
Bangalore, India, 224, 1377.
Bangkok, Siam, 224, 2624.
Bangor, Me., 225, 1681.
Bangs, John Kendrick, 225, 89.
Bangweolo, or Bemba, Lake, 225, 651.
Banim, John, 225.
Banim, John, 225.
Banister, 222.
Banio, 225; guitar, 1217.
Banka Island, 2774.
Banking, 225, 700, 1826, 2538.
Bankiva Fowl, 2297.

Bankruptcy, 227, 2383. Banks, 225; U. S. bank, 226, 1826; panics, 2096. Banks, David, 1964. Banks, Nathaniel Prentice, 227, 516, 1430. Banks, Thomas, 227. Banner, 227, 1008.
Bannockburn, Scotland, 227, 386, 877.
Bantu, 256, 378, 652.
Bantam Fowl, 227; fowl, 1042. Banxring, 227. Banyan, or Banian, 227, 1693. Baobab, 228. Baptist, 228, 2481.
Baptists, 228, 843, 1064.
Baptist Young People's Union, 228.
Baraboo, Wis, 228. Baraboo, Wis., 228.
Barbadaeus, Jacobus, 1431.
Barbados, 228, 3126.
Barbarian, 228; Attila, 181.
Barbarossa, 229. See Frederick I., 1058.
Barbarossa, 229, 717, 1058.
Barbary, 229; Algeria, 67; Fezzan, 9
Morocco, 1851; Tripoli, 2921; Tunis, 2934.
Barbary Ape, or Magot, 229.
Barbary Ape, or Magot, 229.
Barbard, Anna L., 3242.
Barbecue, 229.
Barbel, 229.
Barbel, 229.
Barbert, 229, 2379; beard, 253.
Barberry, 229, 1785.
Barber's Itch, 229.
Barmuda, Island, 229, 1562. 993; Barmuda, Island, 229, 1562. Barmuda, Island, 229, 1562.
Barca, or Barka, 229, 2921.
Barcelona, Spain, 230, 2696.
Barcelona, Venezuela, 229.
Barclay, Robert, 230, 2345.
Barclay, Captain Robert, 2162, 2337.
Barclay de Tolly, Michael, Prince, 230.
Bar-Cochba, Simon, 230.
Bard, 230; poetry, 2245.
Barebones Parliament, 711.
Barefooted Carmelites, 2860.
Barelly, or Bareli, India, 230, 1377. Bareilly, or Bareli, India, 230, 1377. Baret, John, 797. Barge, 230, 320. Barham, Richard Harris, 230. Bar Harbor, Me., 230, 1862. Bari, Italy, 231. Bari, Province of, 100, 231. Baring Brothers, 231. Baring-Gould, Sabine, 231. Baritone, 3060.
Barium, 231, 546, 1766.
Bark, 231, 2815.
Bark Beetle, 231; beetle, 263. Bark Beetle, 231; beetle, 263.
Barker's Mill, 231.
Barkhausen, Hermann, 2404.
Barletta, Italy, 231.
Barley, 231, 261, 1176, 2009.
Barlow, Francis Channing, 232.
Barlow, Jane, 232.
Barlow, Joel, 232, 86.
Barmecide's Feast, 232.
Barmen, Germany, 232.
Barnabas, or Joses, 232, 119 Barnabas, or Joses, 232, 119.
Barnacle, 232, 998.
Barnacle Goose. See Barnacle, 232.
Barnard, Frederick Augustus Porter, 233.
Barnard, Henry, 233.
Barnaul, 77.
Barnburners, 233, 1063. Barnburners, 233, 1063. Barnby, Sir Joseph, 233. Barnes, Albert, 233.

Barneveldt, Jan Van Olden, 233. Barney, Joshua, 233. Barney, Josnua, 233.
Barnstable, Mass., 468.
Barnum, Phineas Taylor, 234, 1596.
Baroda, India, 234.
Barometer, 234, 179, 734, 2899, 3110.
Baron, 1981, 2140, 2855.
Baronius, Caesar, 1720.
Baronius, Caesar, 1720. Baronius, Caesar, 1720.
Barquisimeto, Venezuela, 235.
Barr, Amelia Edith, 235.
Barr, Robert, 235.
Barranquilla, Colombia, 235.
Barras, Paul François, 235.
Barre, Vt., 235, 3034.
Barre Granite, 235, 1179.
Barrel, 236, 667 Barrel, 236, 667. Barrett, Eaton S., 3256. Barrett, Lawrence, 236. Barrie, Ontario, 236. Barrie, James Matthew, 236. Barrier Reef, 236, 672. Barron, James, 236, 549.
Barrow, 236.
Barrow River, 236.
Barrows, John Henry, 236.
Barrows, Samuel June, 237.
Barrow Strait, 237, 1753, 2114.
Barry, Alfred, 237.
Barry, Sir Charles, 237.
Barry, John 237 Barry, John, 237. Barry, William Farguhar, 237. Barry, William T., 2992. Barry, William T., 2992.
Barrymore, Maurice, 237.
Barter, 237, 1825.
Barth, Heinrich, 237, 1114.
Bartholdi, Frédéric Auguste, 238, 1959, 1960.
Bartholdi's Statue of Liberty, 238, 1959, 1960.
Bartholomew, Edward Sheffield, 2570.
Bartholomew, Massacre of Saint, 238, 507, 623.
Bartholomew Fair, 238, 2660.
Bartlett, Josiah, 2995.
Bartlett, Samuel Colcord, 238.
Bartolini, Lorenzo, 238. Bartolini, Lorenzo, 238. Bartolommeo, Fra, 238, Bartolozzi, Francesco, 238. Barton, Bernard, 238. Barton, Clara, 239, 2386. Barton, Sir Edmund, 239. Bartram, John, 239. Baruch, 239, 289. Baruch, Book of, 239, 118, 289. Barye, Antoine Louis, 239. Baryta. See Barium, 231. Basalt, 239, 999, 1137, 2913. Bascom, John, 239. Base, 240. Baseball, 240, 176, 1093. Basedow, John Bernhard, 241. Basel, Council of, 241.
Basel, or Bâle, Switzerland, 241, 2795, 3002.
Base Line, 241, 2782.
Basil, 241. Basilian Manuscripts, 241. Basilica, 241. Basilisk, 242. Basil the Great, Saint, 242. Basilides, 1155. Basin 242. Basket, 242, 1382, 3155. Basket Ball, 242, 1093. Basques, 243, 2695, 2812.

Bas-relief, 243, 909, 2569. Bass, 243; perch, 2156. Bass (voice), 2641. Bassano, Giacomo da Ponte, 243. Basseterre, British East Indies, 243. Bassettre, West Indies, 243. Bassett, Richard, 2989. Bassi, Matteo di, 477. Bassia, 243. Bassora, or Basra, Asiatic Turkey, 243. Bassora, or Basra, Asiatic T Bass Strait, 243, 2822. Basswood. See LINDEN, 1597. Bastia, Corsica, 244. Bastiat, Frederick, 244, 1048. Bastien-Lepage, Jules, 244. Bastille, or Bastille, 244, 1068. Bastions, 1036. Basutoland. South Africa, 244. Basutoland, South Africa, 244. Bat, 244, 257. Batangas, Philippines, 245, 2191. Batangas, Philippines, 245, 2191. Batavia, Java, 245, 1445. Batavia, N. Y., 245 Bate, William Brimage, 245. Bates, William Brimage, 245. Bates, Arlo, 245. Bates, Blanche, 245, 265. Bates, Edward, 245. Bates, John Coalter, 246. Bates College, 1579. Bath, England, 246. Bath, Me., 246, 1681. Bath, N. Y., 246. Bath, Knights of the, 247, 1515. Bath of Ems, 913. Bath of Ems, 913. Bathing, 246; drowning, 832. Bathometer, 247. Bathometer, 247.
Baton Rouge, La., 247, 1636.
Battalion, 247, 1682.
Battering-ram, 247; artillery, 158.
Battersea, England, 326.
Battery, 247; in New York, 123.
Battery, Electric, 750, 1090; voltaic pile, 3062.
Battle, 248; war, 3080.
Battle, 248; war, 3080.
Battle Creek, Mich., 248.
Battleford, Saskatchewan, 248.
Baudry, Paul Jacques Aimé, 248.
Baumgarten, Alexander Gottlieb, 248, 27.
Baur, Ferdinand Christian von, 248, 1130.
Bautzen, Germany, 248. Bautzen, Germany, 248. Bavaria; Kingdom of, 249, 1128. Baxter, Richard, 250, 919, 1447. Bay, or Bay Tree, 250; sweetbay, 1549. Baya, 250. Bayamo, Cuba, 250.
Bayamo, Cuba, 250.
Bayard, James Asheton, 250, 1136.
Bayard, Pierre du Terrail, Chevalier de, 250.
Bayard, Thomas Francis, 250. Bayard, Thomas Francis, 250.
Bayberry Tallow, 461.
Bay City, Mich., 250, 1780.
Bayeux, France, 251.
Bayeux Cathedral, 251.
Bayeux Tapestry, 251; tapestry, 2816.
Eayle, Pierre, 914.
Bayly, Ada Allen, 2327.
Bayonet, 251, 2806.
Bayonne. France, 251.
Bayonne, N. J., 251, 1945.
Bayon State, 1808.
Bay Psalm Book, 84.
Bayreuth. See Baireuth, 212.
Bay Rum, 251.
Bay State, 1727.

Bay Tree, 250.
Bazaar, or Bazar, 251.
Bazaine, François Achille, 251, 1183, 1771.
Beach, Charles Fiske, 252.
Beach, Wooster, 865. Beaconsfield, Benjamin Disraeli, 252, 215. Bead, or Bede, 252; rosary, 2449. Bean, 252, 1027, 2009, 2894. Bear, 252, 2654. Bear, Great and Little, 253, 660. Bear and Bull, 253. Bearberry, 253. Beard, 253; barber, 229; mustache, 1234. Beard, William Holbrook, 254. Beardshear, William M., 254, 875. Bearley, David, 2989. Bear Lake, Great, 1186. Bear River, 254. Beatrice, Neb., 254, 1914. Beatrice Portinari, 254, 750. Beattie, James, 3246, 3247, 3252. Beattie, James, 3246, 3247, 3252.
Beau Brummell, 387.
Beaufort, James, 3238.
Beauharnais, Eugène de, 254, 1471.
Beauharnais, Eugènie Hortense, 254, 332, 1896.
Beaumarchais, Pierre Augustin Caron de, 254.
Beaumont, Francis, 255, 826.
Beaumont, Tex., 255.
Beaumont, William, 255.
Beaumegard, Peter Gustave Toutant, 255, 403.
Beauregard, Peter Gustave Toutant, 255, 403.
Beaver, 255, 1079.
Beaverdam, Wis., 256.
Beaver Falls, Pa., 256.
Beaver State, 2049.
Bebel, Ferdinand August, 256. Beaver State, 2049.
Bebel, Ferdinand August, 256.
Bechuana, 256, 470.
Bechuanaland, 256, 468, 1672.
Becker, George Ferdinand, 256.
Becket, Thomas à, 256, 543, 1286.
Becquerel, Antoine Henri, 257, 3000.
Becquerel Rays, 257. necquerei Rays, 257.
Bed, 257; bedsteads, 257.
Bed, or Stratum, 257.
Bedbug, 257, 1394.
Beddoes, Thomas, 257.
Bede, or Baede, 257, 918.
Bedford, England, 257.
Bedford, Sir Fraderick C Bedford, England, 257.
Bedford, Sir Frederick George Denham, 257.
Bedford, Ind., 257.
Bedford, John Plantagenet, Duke of, 258, 1459.
Bedford, Jr., Gunning, 2989.
Bedlam, or Bethlehem (hospital), 258.
Bedloe's Island, 258, 1959.
Bedouins, 258, 984.
Bee, 258, 117, 1317.
Bee, Gen. Bernard, 1430.
Beech, 260: beech oil, 260.
Beecher, Henry Ward, 260, 88, 2754. Beecher, Henry Ward, 260, 88, 2754. Beecher, Lyman, 260, 2754, 2901. Bee-Eater, 260; king fishers, 1509. Beef, 261, 1586, 2009. Beefeater, 261. Beef Extract, 261. Beer, 261, 369, 988. Beers, 201, 309, 368. Beersheba, 262. Beeswax, 262, 3107. Beet, 262, 2009, 2769. Beethoven, Ludwig von, 262, 1130, 1879. Beetle, 263, 632, 1530, 2546. Beets, Nikolaas, 263.

Beet Sugar, 262, 2770.
Beggar, 264; poor laws, 2271.
Begging Friars. See Black Friars, 815.
Begonia, 264, 3108.
Behemoth, 264.
Behistun, Persia, 264, 725.
Behistun Inscription, 725.
Behring, Emil Adolf, 264.
Behring Sea. See Bering Sea, 279.
Beirut. See Beyrout, 287.
Bejapoor, India, 265.
Bel, or Baal, 202, 1450, 1979.
Bela, kings of Hungary, 265.
Bel and the Dragon, 265, 118, 289.
Belasco, David, 265.
Belcher, Sir Edward, 1657.
Belem, 2100.
Belfast, Ireland, 265, 1406.
Belfast, Ireland, 265, 1681.
Belgium, 265, 1011, 1572, 3102.
Belgrade, Servia, 267, 2592.
Belief, 267.
Belisarius, 267, 3018.
Belize, British Honduras, 267.
Belize River, 267, 521.
Belknap, George Eugene, 267.
Belknap, William R., 1371.
Belknap, William R., 1371.
Belknap, William Worth, 267.
Bell, 267; Great Peter's Bell, 1152; Moscow, 1857.
Bell, Alexander Graham, 269, 892, 2838.
Bell, Alexander Graham, 269, 892, 2838. Bell, Alexander Graham, 269, 892, 2838. Bell, Andrew, 269. Bell, Sir Charles, 269, 2206. Bell, Henry, 269. Bell, Hill McClelland, 825. Bell, Hill McClelland, 825.
Bell, John, 269.
Bell, Patrick, 1261.
Bell, Robert, 269.
Belladonna, or Deadly Nightshade, 270, 1975.
Bellaire, Ohio, 270.
Bellamy, Edward, 270, 3008.
Rellamy, Jacob, 1927.
Bellbird, 270.
Bellefontaine, Ohio, 270. Bellefontaine, Ohio, 270. Bellefontaine, Ohio, 270.
Belle Isle, 270.
Belle Isle, Strait of, 270, 2494.
Bellerophon, 270, 561.
Belleville, Ill., 270, 1367.
Belleville, Ontario, 270, 2040.
Belleville, Wy., 271.
Bellidower, 449.
Bellidower, 449.
Bellidower, 449.
Bellidower, 449. Bellevue, Ky., 271.
Bellflower, 449.
Belliflower, 463, 1929, 3080.
Bellingham, Wash., 271, 3095.
Bellini, Gentile, 271.
Bellini, Giovanni, 271, 2884.
Bellini, Jacopo, 271.
Bellini, Jacopo, 271.
Bellini, Vincenzo, 271.
Belloma, Karl Michael, 271, 2787.
Belloma, 271.
Bellows, 271, 2052.
Bellows, Henry, 2521.
Bell Rock, cr Inch Cape, 271.
Belmont, August, 271.
Belmont, August, 271.
Beloit, Wis., 272, 3169.
Beloit College, 272.
Belon, Pierre, 1359.
Belshazzar, 272, 205.
Belt, Great and Little, 272.
Belt, or Belting, 272, 1384.
Beluchistan., See Baluchistan, 222.

Beluga, 272; whale, 3131.
Belvidere, Ill., 272.
Belzoni, Giavonni Battista, 272.
Bem, Josef, 272.
Bemba. See Bangweolo, 225.
Bénard, M. Emile, 440.
Benares, India, 273.
Bender, or Bendery Russia, 273. Bender, or Bendery, Russia, 273.
Benderti, Jacopone, 2720.
Benedict, 273, 2273.
Benedict XIV., 273, 2274.
Benedictine Monastery, 1824.
Benedictines, 273, 1824.
Benedictines, 273, 1824. Benedict, 273, 2274.
Benedictines, 273, 1824.
Beneke, Friedrich Eduard, 874.
Benevento, Italy, 274.
Bengal, British India, 274, 1374.
Bengal, Bay of, 275.
Bengazi, Africa, 229, 2921.
Bengali, 275.
Bengazi, Africa, 275.
Beni, River, 275, 327.
Beni-Hassan, Tower of, 2359.
Ben Hur, 3074; Tribe of, 274.
Benin, Upper Guinea, 275.
Benin, Upper Guinea, 275.
Benin, Bight of, 1215.
Benjamin, 275, 1455, 1471.
Benjamin, Judah Philip, 275.
Ben Lomond Mountain, 275.
Bennett, James Gordon, 275, 1473.
Bennett, James Gordon, 275, 1473.
Bennett, James Gordon, 276, 2561.
Bennington, Battle of, 276, 2727.
Bennington, Vt., 276, 3034.
Benoit, Pierre Leonard Leopold, 276.
Benson, Frederick, William, 276.
Bentham, George, 276.
Bentham, George, 276.
Bentham, Jeremy, 276, 1788.
Bentinck, Lord William, 2873.
Bentley, Richard, 276.
Benton, Thomas Hart, 277, 1066, 1605.
Benton Harbor, Mich., 277.
Benzene, or Benzole, 277, 104, 1892.
Benzine, 277, 2177.
Benzole. See Benzene, 277.
Benzole. See Benzene, 277.
Benzole. See Benzene, 277.
Benzole, See Benzene, 277.
Benzole, 777, 2439.
Beranger, Pierre Jean de, 277.
Berbers, 278, 229, 2487, 3018.
Berenice, Saint. Same as Veronica, 3036.
Beresford, Charles William, 278.
Bergamo, Italy, 278.
Bergamo, Italy, 278.
Bergamo, Italy, 278.
Bergamon, Froster Olaf, 279, 2787.
Bergmann, Ernst von, 279.
Berhampur, India, 279.
Bering Sea, Question, 279, 1006, 1253, 1258.
Bering Sea, 279, 3132.
Bering Sea Question, 279, 1006, 1253, 1258.
Bering Strait, 280, 135.
Berkeley, George, 280, 1363.
Berkeley, George, 280, 1363.
Berkeley, Sir William, 280, 207.
Berkshire Hills, 280, 1727.
Berlin, N. H., 280, 1942.
Berlin, Ontario, 280, 2040.

Berlin, Treaty of, 282, 301, 401, 2593. Berlin, University of, 282, 2997. Berliner, Emile, 1177. Berlioz, Hector, 282. Bermuda, or Somers' Islands, 282. Bermuda Grass, 282. Bermudez, Juan, 282. Bernadotte, Jean, 282.
Bernadotte, Jean Baptiste Jules, 283, 2788.
Bernard, Great Saint, 283, 2488.
Bernard, Little Saint, 2488.
Bernard, Saint, 283.
Bernard Dog, Great Saint, 283, 811.
Berne, or Bern, Switzerland, 283, 2705.
Bernhardt Rosine 284, 2531 Bernhardt, Rosine, 284, 2531. Bernini, Givonni Lorenzo, 284, 2570. Bernstorff, Count Johann Heinrich, 284 Berry, 284; fruit, 1075. Bertha of Rosenberg, 3141. Berthelot, Pierre Eugène Marcellin (b. 1827), Berthold V., 283. Bertrand, Henri Gratien, 3209. Beryl, 284, 910. Berzelius, John Jakob, Baron, 284, 546, 2581, Besançon, France, 284. Besant, Sir Walter, 285, 2004. Besant, Annie, 311. Besant, Annie, 311.
Bessarabia, Russia, 285.
Bessemer, Ala., 285, 47.
Bessemer, Sir Henry, 285, 273
Bessemer Process, 1411, 2737.
Bessey, Charles Edwin, 285.
Betel, or Betle, 285, 2008.
Bethany, Palestine, 285.
Bethesda, 286.
Bethlehem, 286, 1452.
Bethlehem, Pa., 286.
Bethsaida, 286.
Bethsaida, 286.
Beust, Frederich Ferdinand. Co 2737. Beust, Frederich Ferdinand, Count von, 286. Bethman-Hollweg, Theobald von, 286. Beverage, 261; abstention from, 2901. Beverage, 261; abstention from, 2901.
Beveridge, Albert Jeremiah, 286.
Beverly, Mass., 286.
Bewick, Thomas, 286.
Beyrout, or Beriut, Syria, 287, 2801.
Beza, Theodore, 287.
Bèziers, France, 287.
Bhutan, or Bhotan, India, 287.
Biafra, Bight of, 287, 989, 1215.
Bias, 287, 2595.
Bible, 287, 64, 118, 465, 691, 706, 819, 1227, 1231, 1326, 1415, 1416, 1449, 1460, 1468, 1710, 1735, 1777, 1919, 2013, 2154, 2326, 2477, 3065.
Bible Distribution, 289.
Bibliography, 289. Bible Distribution, 289.
Bibliography, 289.
Bibliomania, 290.
Bibliothèque Nationale, 1583.
Biceps, 290, 1876.
Bichloride of Mercury, 682.
Bicycle, 290, 734; tricycle, 2919.
Biddeford, Me., 290, 1681.
Biddle, James, 291.
Biddle, John, 291, 919.
Bidwell, John, 291, 919.
Bidwell, John, 291, 2319.
Biedermann, Frederich Karl, 291.
Biela, Wilhelm von, 291, 640. Biela, Wilhelm von, 291, 640. Biela's Comet, 291, 640. Biennials, 2233. Bienville, Jean Baptiste le Moyne, 291, 1636. Bier, August. 94.

Bierstadt, Albert, 291. Bigamy, 292; marriage, 1714. Big Bend State, 2842. Big Bethel, Va., 292. Big Black River, 292, 1808. Bigelow, Poultney, 292. Biger, King Jarl, 644. Big Horn River, 292, 3204. Big Horn. See Rocky Mountain Goat, 2433. Biglow Papers, 1640. Bignonia, 292. Big Rapids, Mich., 292. Big Sandy River, 292, 1500. Bildad, 3008. Bilderdijk, Willem, 1013. Bile, 292, 1609, 2208. Bill, 292, 2985. Bill (statement), 293. Billiards, 293; pool, 2270.
Billings, Mont., 294.
Billings, John Shaw, 294, 486.
Billings, Josh. See Shaw, Henry Wheeler, 2606. Billingsgate, 294.
Bill Nye, 2009.
Bill of Attainder, 293, 181.
Bill of Costs, 293. Bill of Exchange, 293, 544. Bill of Exception, 293. Bill of Health, 293. Bill of Health, 293.
Bill of Health, 293, 1480.
Bill of Indictment, 293, 2383.
Bill of Rights, 293, 769.
Bill of Sale, 293, 769.
Bill of Sale, 293.
Bill of Sale, 294, 291.
Bimetallism, 294, 390, 2260.
Binding Twine, 295, 1694.
Binet, Alfred, 295.
Bingen, Germany, 295.
Bingham, John Arend, 295.
Binghampton, N. Y., 295 1958.
Binney, Horace, 295.
Binomial, 295, 1955.
Biobio River, 295.
Biography, 296. Biography, 296. Biology, 296; botany, 376; zoölogy, 3225. Birch, 297. Birch, 297.
Bird of Paradise, 297, 352.
Birds, 297, 199, 1145.
Bird's-foot Trefoil, 1630, 2915.
Birds' Nests, 298, 1923.
Bird's Nests, Edible, 1923, 2784.
Birds of Passage, 299. Birds of Passage, 299.
Birkenhead, England, 299, 1763.
Birney, James G., 1582.
Birmingham, Ala., 299, 47.
Birmingham, England, 299, 918.
Birnam, Scotland, 300.
Birney, James Gillespic, 300, 1582.
Birrell, Augustine, 1408.
Biscay, Spain, 300; Basgues, 243.
Biscay, Bay, 300, 948, 2379.
Biscuit, 300, 366.
Bishop, 300, 131, 2874.
Bismarck, N. D., 300, 2978.
Bismarck Archipelago, 300, 629.
Bismarck-Schonhausen Karl Otto Eduard, 301, 1132, 3152. 1132, 3152. Bismarck-Schonhausen, Wilhelm Albrecht, 301, Bismuth, 301, 546, 2578.
Bison, 302; buffalo, 397.
Bissagos, or Bijuga, Islands, 302.

Bissel, Wilson Shannon, 302, 601. Bithynia, Asia Minor, 302, 166. Bitolia. See Monastir, 1825. Bittern, 302; heron, 1294, 1974. Bitternut, or Nutmeg Hickory, 1298. Bitterroot, 303.
Bittersweet (nightshade), 1975.
Bitter Sweet, 1312.
Bitterwood, 303, 2346.
Bittnger, J. B., 3239.
Bitumen, 303, 167.
Bituminous Coal. See Coal, 609.
Bituminous Shale, 303; coal, 609.
Bivalves, 303, 1821, 1882.
Bizet, Alexandre César Léopold, 303.
Björnson, Björnstjerne, 303, 1999.
Black, Jeremiah Sullivan, 303.
Black, William, 304.
Blackader, Alexander Dougall, 304. Bitterroot, 303. Black, William, 304.
Blackader, Alexander Dougall, 304.
Blackballed, 218.
Black Beard (Teach), 2221.
Black Beauty, 1324.
Blackberry, 304, 3162.
Blackberry, 304; cowbird, 692.
Blackburn, England, 304, 918.
Blackburn, Joseph Clay Styles, 304.
Black Death. See Plague, 2229.
Black Eagle, Order of, 853.
Blackfeet, 305, 2534.
Blackfish, or Tautog, 305.
Black Forest, or Schwarzwald, 305, 208.
Black Friars, 815.
Black Friday, 305.
Black George, or Czerny George, 2593. Black Friday, 305.
Black George, or Czerny George, 2593.
Black Gum, or Sour Gum, 305; gum, 1218.
Black Hawk, 305, 2482.
Black Hawk War, 97, 305, 2482.
Black Hawk War, 97, 305, 428.
Black Hills, S. D., 305, 2689.
Black Hole, or Black Hole of Calcutta, 306, 434 Blackie, John Stuart, 306. Blacking, 306, 1536. Black Lead. See Graphite, 1182. Blacklist, 306. Blackmail, 306. Blackmail, 306.
Blackmore, Richard Doddridge, 306, 920.
Black Mountains, 306, 1990.
Black Prince. See Edward III., 877.
Black River, 1811, 3142.
Black Sea, 306, 205, 948.
Black Sea, 306, 205, 948.
Black Stone, The, 1483, 1746.
Blackstone, Mass., 307.
Blackstone, Sir William, 307, 35.
Blackwell, Antoinette Louisa Brown, 307.
Blackwell, Elizabeth, 307.
Blackwell, Elizabeth, 307.
Blackwell's Island, 307, 1959.
Blackwell's Island, 307.
Pladder, 1088, 1506.
Bladder Nut, 307.
Bladderwort, 307.
Bladderwort, 307.
Bladdersburg, Md., 308.
Blair, Francis Preston, 308, 2600.
Blair, Francis Preston, 308.
Blair, Henry William, 308.
Blair, James, 309.
Blair, John, 2989.
Blair, John, 2989.
Blair, John Insley, 309.
Blair, Montgomery, 309. Blackmore, Richard Doddridge, 306, 920.

Blake, Edward, 309. Blake, Robert, 309, 2923. Blake, Robert, 309, 2923.
Blake, William, 309.
Blanc, Jean Joseph Louis, 309.
Blanc, Marie Therese, 309.
Blanc, Mont. See Mont Blanc, 1835.
Bland, Richard Parks, 310.
Blank Verse, 310; poetry, 2245.
Blarney, 310.
Blast Furnace, 310, 1020, 1411.
Blasting, 311; gunpowder, 1220.
Blauvelt, Lillian Evans, 311.
Blavatsky, Helena Petrovina, 311, 2859.
Bleaching, 311, 1597.
Elende, or Sphalerite, 312, 3220.
Blenheim, Germany, 312, 248, 944.
Blennerhassett, Harman, 312, 414. Blennerhassett, Harman, 312, 414. Blessington, Marguerite, Countess of, 312. Blessington, Marguerite, Coun Blicher, Steen, 783. Blind, 312; training of, 373. Blind, Carl, 313. Blind Fish, 313, 1688. Bliss, Cornelius Newton, 313. Blisser, 313. Blister, 313. Blister Steel, 2736 Blizzard, 313, 2752. Block. See PULLEY, 2332. Blockade, 313, 2629. Blockhouse, 314. Blockhouse, 314. Block System, 314, 2368. Bloemfontein, South Africa, 314, 2047. Block System, 314, 2368.
Bloemfontein, South Africa, 314, 2047.
Blondin, Charles Emile Gravelet, 314.
Blood, 314, 473, 585, 1262, 1274; styptic, 2765
Blood Circulation, 315.
Bloodhound, 315, 811, 2721.
Bloodroot, 315.
Bloodstone, 35, 1281, 2750.
Bloomer, Amelia, 315.
Bloomfield, N. J., 316.
Bloomfield-Zeisler, Fanny, 316.
Bloomington, Ill., 316.
Bloomington, Ind., 316.
Bloomington, Ind., 316.
Bloomsburg, Pa., 316.
Blount, William, 2989.
Blowfly, or Flesh Fly, 316.
Blowing Machine, 316; bellows, 271.
Blowpipe, 317, 150.
Blubber, 317, 2573, 3131.
Blücher, Gebhard von, 317, 1896, 2377, 3102.
Blueberd, 317.
Bluebell, or Harebell, 1252.
Bluebell, or Plus Warkley, 218 Bluebeard, 317.
Bluebell, or Harebell, 1252.
Bluebird, or Blue Warbler, 318.
Blue Book, 318.
Bluefish, 318, 2922; mackerel, 1664.
Blue Grass, 318.
Blue Grass State, 318, 1500.
Blue Island, Ill., 318.
Blue Laws, 318.
Blue Mountains, 318, 1951. Blue Mountains, 318, 1951. Blueprint, 318, 681. Blue Racer, 307.
Blue Ridge, 319, 119, 1119.
Blue Warbler. See Bluebird, 318.
Blumenbach, J. F., 941.
Blumenthal, Leonhard, 319.
Blunt, William, 1371. Blushing, 319.
B'nai B'rith, Independent Order of, 274
Boa, 319, 2663.
Boadicea, 319.

Boar, 320, 2792.
Boardman, George Dana, 320.
Board of Trade, 320; stock exchange, 2746.
Boat, 320; barge, 230; canoe, 464; cutter, 732; ferry, 990; galley, 1088; gunboat, 1219; lifeboat, 1586; monitor, 1827; pinnace, 2219; ram, 2371; ship, 2616; steamboat, 2732; torpedo boat, 2898; trireme, 2921; yacht, 3198.
Boatbill, 320.
Boaz, 2477.
Bobbin, 321, 2599.
Bobolink, 321.
Bobwhite, 2344.
Boccaccio, Giovanni, 321, 1422, 2003. Bobwhite, 2344.
Boccaccio, Giovanni, 321, 1422, 2003.
Bochum, Germany, 321.
Böckh, Augustus, 321.
Böde, Johann Elert, 321.
Bodelschwingh, Pastor von, 927.
Bode's Law, 322, 2231.
Bodleian Library, 322, 1583.
Bodmer, Johann Jakob, 1129, 2795.
Boehmeria, 322. Bodmer, Johann Jakob, 1129, 2795. Boehmeria, 322. Boehmeron Bawerk, Eugen, 322. Boeotia, Greece, 322, 181. Boer, 322, 1522, 2912. Boerhaave, Hermann, 323, 1927. Boer War, 1472, 1522, 2047, 2680. Bog, 323, 1716, 2134. Bogardus, James, 323. Bogardus, James, 323. Bogotá, Colombia, 323, 3196. Bogue, David, 323. Bohemia, 323, 195, 1344, 2389. Bohemian Brethren, 638.
Bohemian Brethren, 638.
Bohemian Forest, 324.
Bohemian Girl, The, 215.
Böhmerwald, 193, 249, 1125.
Bohnenberger, Johann, 1226.
Bohol, Island, 324, 2187.
Boies, Horace, 325.
Boil, 325, 481.
Boileau-Despreauz, Nicholas, 325.
Boiler, 325; steam, 2731.
Boiling, 325.
Boiling Point, 326, 2861.
Boise, Idaho, 326, 1362.
Bojador, Cape, 326.
Boker, George Henry, 326, 3248.
Bokhara, 326, 2944.
Bolan Pass, 326.
Boleyn, Anne. See Anne Boleyn Bohemian Brethren, 638. Bolan Pass, 320.
Boleyn, Anne. See Anne Boleyn, 107.
Bolingbroke, Henry Saint John, 326.
Bolivar, Simon, 327, 1960.
Bolivia, 327, 174, 559.
Boll Weevil, 687, 1389, 3116.
Bologna, Italy, 329, 1421.
Bologna, University of, 329; Bolometer, 329.
Rolebavili, 320. Bologna, University of, 329; Bolometer, 329. Bolsheviki, 329. Bolton, or Bolton-le-Moors, England, 329 Bolton, Sarah K., 3249. Boma, Congo Free State, 329, 652. Bomb, 329, 2610. Bombala, Australia, 192. Bombardier Beetle, 330, 263. Bombardment, 330; war, 3080. Bombay, India, 330, 1377. Bona, or Bône, Algeria, 331, 68. Bonaccio, Leonardo, 66. Bona, or. Bone, Algeria, 331, 68.
Bonaccio, Leonardo, 66.
Bonanza, 331; Bonanza Creek, 762.
Bonaparte, Charles Joseph, 331.
Bonaparte, Elizabeth Patterson, 331.
Bonaparte, Jérôme, 331, 3128.
Bonaparte, Joseph, 331, 988, 1895, 2148, 2698.

Bonaparte, Louis, 331. Bonaparte, Lucien, 332. Bonaparte, Marie Letizia Ramolino, 332. Bonaparte, Napoleon, 1894. Bonaparte, Napoleon, 1894.
Bonar, Horatius, 3254.
Bond, Sir Robert, 332; Bone, 332, 2646.
Boneblack, or Animal Charcoal, 333, 533.
Bone Dry Laws, 2902.
Boneset, or Thoroughwort, 333, 2894.
Bonham, Tex., 333.
Bonheur, Marie Rosa, 333.
Bonheur, Marie Rosa, 334, 1469. Bonhomme Richard, 334, 1469. Boniface I., 334, 2273. Boniface VIII., 334. Boniface XIII., 334, 2273. Boniface XIII., 334, 2273.
Boniface, Saiut, 334.
Bonn, Germany, 334.
Bonn, University of, 334, 1125.
Bonnet, Robert, 334.
Bonnet, Charles, 2795.
Bony Pike, 334.
Bonython, Sir John Langdon, 334.
Booky, 335; gannet, 1094.
Book, 335, 514, 2018.
Bookbinding, 336, 214.
Bookkeeping, 336.
Book of Mormon, 337, 1849.
Book of the Dead, 883. Book of the Dead, 883. Bookplate, 337. Books for the Blind, 313. Boom, 337. Boomerang, 337, 190. Boomer State, 2026. Boone, Iowa, 337, 3041. Boone, Daniel, 337, 1502. Boone, Enoch, 337. Boonesborough, Ky., 337. Boonesborough, Ky., 337.
Boötes, Constellation of, 136.
Booth, 338; voting booth, 193.
Booth, Ballington, 339, 2510.
Booth, Edwin Thomas, 338.
Booth, John Wilkes, 338, 1595.
Booth, Junius Brutus, 338.
Booth, Maud Ballington, 338.
Booth, William, 338, 2510.
Boothby, Guy Newell, 339.
Boothia Felix, 339, 2452.
Booth-Tucker, Emma Moss, 339.
Bootle, England, 339. Bootle, England, 339.
Bootle, England, 339.
Boots, 339, 2619.
Bopp, Franz, 2194, 2294.
Bora, Catherina von, 1647.
Borax, 339, 341, 3118. Borax, 339, 341, 3118.
Borchgrevink, Carsten Egeberg, 340.
Bordeaux, France, 340, 1046.
Bordeaux Wine, 3162.
Borden, Gail; 340, 2144.
Bordentown, N. J., 340.
Border, The, 340.
Borghese, Camillo, Prince, 340.
Borghese Gladiator, 34.
Borgia, Cesare, 341.
Borgia, Lucretia, 341.
Boric Acid, 341.
Boring Machine, 341: auger, 183. Boric Acid, 341.
Boring Machine, 341; auger, 183.
Borneo, Island, 341.
Bornu, 342; Sudan, 2767.
Borodino, Russia, 342, 1895.
Boron, 342, 546.
Borromean Islands, 342.

Bosna-Serai, or Serajevo, Bosnia, 342. Bosnia, Jerait, or Serajevo, Bosnia, 342.
Bosnia, Austria-Hungary, 342, 194.
Bosporus, Strait, 343, 1712.
Bossuet, Jacques Bénigne, 343, 986, 1048.
Boston, Massacre, 346.
Boston, Tan, Partic, 246, 2076. Boston Massacre, 346.
Boston Tea Party, 346, 2979.
Boston University, 346, 1729.
Boswell, James, 346, 296.
Bosworth, England, 346; battle of, 1287.
Botany, 346, 1020, 1184, 2579; cotyledon, 688.
Botany Bay, 347.
Botetourt, Norborne Berkeley, 348.
Bothly, 348, 1083.
Botha, Louis, 348.
Bothnia, Gulf of, 219, 348.
Bothwell, James Hepburn, 348, 1723, 2565.
Bo Tree, or Peepul, 348. Bothmal, Gulf of, 219, 348.
Bothwell, James Hepburn, 348, 1723, 2
Bo Tree, or Peepul, 348.
Botta, Paul Émile, 348.
Böttger, John Friedrich, 348, 2296.
Botticelli, Alessandro Filipepi, 348.
Bottle, 348, 1149.
Boucicault, Dion, 349.
Boulanger, Georges Ernest, 349, 2771.
Boulder, 349; erratic boulder, 349.
Boulder, Colo., 349.
Boulogne-sur-Mer, France, 349.
Boulogne-sur-Seine, France, 349.
Bounty, 350, 1064.
Bounty Jumpers, 350.
Bourbon, 350, 529, 3014.
Bourbon, Charles, 350.
Bourdaloue, Louis, 1048. Bourdaloue, Louis, 1048. Bourges, France, 350. Bourget, Paul, 351, 1049. Bourinot, John George, 351, 456. Boussard, M., 884. Boutelle, Charles Addison, 351. Boutwell, George Sewell, 351. Bouvines, Battle, of, 2185. Bouvines, Battle of, 2185. Bovee, C. N., 3255. Bow. See VIOLIN, 3051. Bow, 351, 154. Bow River, 55, 224. Bow River, 55, 224.
Bowdoin, James, 351.
Bowdoin College, 351, 1680.
Bowell, Sir Mackenzie, 352.
Bowen, Francis, 352.
Bowen, Bird, 352.
Bowles, William Lisle, 352.
Bowling, 352; bowling alleys, 353.
Bowling Green, Ky., 353, 1502.
Bowling Green, Ohio, 353.
Box-Elder, or Ash-Leaved Maple, 353.
Boxers, 568, 976, 1591.
Boxing, 353; games, 1093.
Box Tree, 353.
Boxwood, Turkish, 3178.
Boycotting, 353. Boxwood, Turkish, 3178.
Boycotting, 353.
Boydell, John, 353.
Boyesen, Hjalmar Jhorth, 354.
Boyle, Robert, 354, 546, 1794.
Boyne, Battle of, 354, 1435.
Boyne River, 354. Boyne River, 354.
Bozeman, Mont., 354.
Bozzaris, Marco, 354, 2791.
Brabant, 354, 266, 1926.
Bracco, Roberto, 1422.
Brace, Charles Loring, 355.
Braddock, Edward, 355, 64, 3096.
Braddock's Field, Battle of, 355.

Braddock, Pa., 355.
Braddon, Mary Elizabeth. See Maxwell, 1740.
Bradford, England, 355.
Bradford, Pa., 355.
Bradford, William, 355, 2214.
Bradley, James, 7.
Bradley, Joseph Philo, 355.
Bradshaw John, 355. Bradshaw, John, 355. Bradstreet, Anne, 356, 85. Bradstreet, Simon, 356. Bradstreet, Anne, 356, 85.
Bradstreet, Simon, 356.
Brady, Cyrus Townsend, 356.
Brady, Cyrus Townsend, 356.
Bragg, Baxton, 356, 557, 2162.
Bragg, Edward Stuyvesant, 356.
Bragg, Thomas, 356.
Brahe, Tycho, 356, 1503, 2003, 2015.
Brahma, 357, 3057.
Brahmanism, 357, 396; Hindus, 2394.
Brahmans, 357, 396; caste, 500.
Brahmanutra, 357, 779.
Brahman, 358, 118; cerebellum, 523; cerebrum, 523; nerves, 1922.
Brainerd, Minn., 359, 1802.
Brainerd, Minn., 359, 1802.
Brain Fever, 359.
Brain Fever, 359.
Brain Fever, 359.
Braintree, Mass., 359, 18, 2855.
Brake, 359, 644.
Brake, or Bracken, 359.
Bramble, 359, 304.
Brandenburg, Prussia, 359, 2325.
Brandes, Carl Edvard, 783.
Brandes, Georg Morris Cohen, 360.
Brandis, Christian August, 334.
Brandon, Canada, 360, 1696.
Brandy, 360, 57, 548.
Brandywine, Battle of, 360, 1330.
Brant, Joseph, 360, 2054.
Brant, or Brandt, Sebastian, 360.
Brantford, Ontario, 361, 312.
Bras d'Or Inlet, 468.
Brass, 361, 669, 3220.
Brassey, Thomas, 361.
Brattle, Thomas, 3171.
Brattleboro, Vt., 361, 3034.
Brazil, Ind., 361.
Brazil, 1nd., 361.
Brazil, 361, 2139, 2140, 2684, 3038.
Brazili Nut, or Cream Nut, 364, 2008.
Brazza, Island, 365.
Brazza, Island, 365.
Brazza, Island, 365.
Brazza, Flerre Savorgnan de, 365, 1068.
Brezza, 1965, 213, 2009, 3203. Brazza, Island, 365.
Brazza, Pierre Savorgnan de, 365, 1068.
Bread, 365, 213, 2009, 3203.
Breadfruit, 366.
Breadnut, 366. Breakwater, 366; Buffalo, 397; Delaware Bay, 776. Breathing. See RESPIT Bréche-de-Roland, 316. See RESPIRATION, 2400. Bréche-de-Roland, 316.
Breckenridge, John Cabell, 366, 2260.
Breckenridge, Robert Jefferson, 366.
Breckenridge, William Campbell Preston, 366.
Breda, Holland, 367.
Breech-Loading Guns, 367, 413.
Breeding, 367, 511, 1324, 1905.
Breed's Hill, 405.
Breitinger, Johann Jakob, 2795.
Breitmann, Hans, 1566.
Bremen. Germany, 367, 1249.

Bremer, Fredrika, 367, 2787. Bremerhaven, Germany, 367, 3122. Brenham, Tex., 368, 2853. Brennan, Louis, 1226. Brentano, Clemens, 826. Brescia, Italy, 368. Brescia, Italy, 308.
Breslau, Germany, 368, 268, 1250.
Brest, France, 368.
Brest-Livotsk, Russia, 368, 286, 329.
Breton, Cape, 468, 2001.
Bréton, Jules Adolphe, 368; Bretons, 379.
Breviary, 368, 1676.
Brewer, David Josiah, 368.
Brewing, 369; beer, 261; malt, 1686. Brewer, David Josiah, 368.
Brewing, 369; beer, 261; malt, 1686.
Brewster, Sir David, 369, 1485, 1794.
Brewster, William, 369, 2214.
Bribery, 369.
Brice, Calvin Steward, 369.
Brick, 369; kiln, 1507; adobe, 23, 370.
Bricklaying, 370.
Bridal Veil Falls, 3209.
Bridewell, 370.
Bridee, 371: Brooklyn, 372, 381, 1962; c Bridge, 371; Brooklyn, 372, 381, 1962; cantilever, 466; Forth, 1035; pontoon, 2270; suspension, 372; Victoria, 3046. 372; Victoria, 3046. Bridgeport, Conn., 372, 656. Bridgetow, N. J., 372. Bridgetown, Barbados, 372, 228. Bridgewater, Mass., 373. Bridgewater, Nova Scotia, 373. Bridgewater Canal, 1691. Bridgman, Laura Dewey, 373. Briennius, Nicephorus, 106. Bries, Gerrit de. 2485. Bries, Gerrit de, 2485. Brig, 2616. Brigade, 247. Brigadier General, 2394. Brigadier General, 2334.
Brigandage, 373, 2627.
Briggs, Charles Augustus, 373, 2110.
Brigham Young College, 1617.
Bright, John, 373.
Bright, Robert, 374.
Bright, Timothy, 2620. Bright, Robert, 374.
Bright, Timothy, 2620.
Brighton, England, 374.
Bright's Disease, 374, 980, 1506.
Brimstone. See SULPHUR, 2773.
Brindisi, Italy, 374.
Brinton, Daniel Garrison, 374.
Brisbane, Australia, 374, 2352.
Briscoe, Captain, 182.
Bristles, 374, 1232, 2792.
Bristles, 374, 1232, 2792.
Bristol, Conn., 374, 656.
Bristol, England, 375, 918.
Bristol, Pa., 374.
Bristol, R. I., 375.
Bristol, R. I., 375.
Bristol, Tenn., 375, 2844.
Bristol Channel, 375, 917.
Bristow, Benjamin Helm, 375.
Britain, 319, 429, 832.
Britannica, Encyclopaedia, 914.
Brith Abraham Order, 274.
British America, 375, 451, 629, 1937.
British Association, Advancement of Science, 375. British Central Africa, or Nyassaland, 375, 2009. British Colonies, 1189. British Columbia, 376, 455, 3017. British East Africa, 378, 2684. British Guiana, 378, 2684. British Honduras, 378, 267. British Isles, 378, 1186. British Museum, 378, 1583.

British New Guinea, 1940. British South Africa, 468. Brittany, or Bretagne, 379, 527, 2396. Brocade, 379; silk, 2635. Brock, Sir Isaac, 379, 1117, 2353, 3084. Brocken, Germany, 379; Wa'purgis, 3076. Brockville, Ontario, 379. Broglie, Jacques Victor Albert, 380. Broken Wind, or Heaves, 380. Broker, 380: agent, 35. Broken Wind, or Heaves, 380. Broker, 380; agent, 35. Bromine, 380; agent, 35. Bromine, 380; lungs, 1646. Bronchi, 380; lungs, 1646. Bronchial Tubes, 380, 1646 2401. Broncho, 380, 618. Brontë, Anne, 380, 2327. Brontë, Charlotte, 380, 2327. Brontë, Emily, 380, 2327. Bronze, 381, 2881. Bronze Age, 381, 35, 670, 2749. Brook Farm, 381, 2424. Brookfield, Mo., 381. Brook Farm, 381, 2424.
Brookfield, Mo., 381.
Brookline, Mass., 381.
Brooklyn, N. Y., 381, 1960.
Brooks, James, 700.
Brooks, Phillips, 382, 1606.
Brooks, Preston Smith, 382.
Broom, 382.
Broom, Jacob, 2080 Broom, Jacob, 2989. Broom Corn, 382, 993, 2677. Brotherhood of Andrew and Philip, 382. Brotherhood of Saint Andrew, 382, 928. Brough, John, 382. Brougham, Henry, 382, 705.
Broughams, 491, 689.
Broughton, Hugh, 288.
Broughton, William Robert, 542.
Brown, 383; color, 629.
Brown, Banjamin Carte, 202 Brown, Benjamin Gratz, 383.
Brown, Charles Brockden. 86.
Brown, Elmore E., 383, 875, 1257.
Brown, George, 383.
Brown, Henry Billings, 383.
Brown, Jacob, 383, 569.
Brown, John (author), 383.
Brown, John, 384, 1255, 2981, 3170.
Brown, John, Calvin, 384. Brown, Benjamin Gratz, 383. Brown, John Calvin, 384. Brown, John George, 384. Brown, Joseph Emerson, 384. Brown, Robert, 1373. Brown, Mount, 452. Browne, Charles Farrar, 155, 2327. Browne, Sir Thomas, 384. Browne, Thomas Alexander, 384. Brownies, 969, 2329. Browning, Elizabeth Barrett, 385, 920. Browning, Oscar, 385. Browning, Robert, 385, 187, 920. Browning, Robert, 385, 187, 920.
Brown-Séquard, Charles Édouard, 385.
Brownsville, Tex., 386, 2423.
Brown University, 386, 2324.
Bruce, Blanche Kelso, 386.
Bruce, James, 386, 1114, 1977.
Bruce, Robert, 386, 877, 2564. Bruce, Robert, 380, 811, 2304. Bruges, Belgium, 387, 514. Bruggemann, Hans, 496. Brummell, George Bryan, 387. Brunehilde, 1968. Brunelleschi, Filippo, 387.

Brunetiere, Ferdinand, 387. Brunswick, Ga., 387, 1845.
Brunswick, Ga., 387, 1121.
Brunswick, Me., 388.
Brunswick, Germany, 388.
Brunswick, Duchy o., 388, 1128.
Brusa, or Broussa, Asiatic Turkey, 388.
Brush, Charles Ergneis, 388 Brusa, or Broussa, Asiatic Turkey, 388.
Brush, Charles Francis, 388.
Brush Turkey, 388, 1861.
Brussels, Belgium, 389, 266, 490.
Brussels Carpet, 490.
Brutus, Lucius Junius, 389, 2821.
Brutus, Marcus Junius, 389, 430, 2443.
Brutus, The Trojan, 389.
Bryan, William Jennings, 390, 1665, 2260.
Bryant, William Cullen, 390, 86, 3242.
Bryce, George, 391, 456.
Bryce, James, 391, 1408.
Bryn Mawr College, 391.
Bryophytes, 392, 1610.
Bubastis, or Bubastus, Egypt, 392.
Bubonic Plague. See Plague, 2229.
Buccaneers, 392; piracy, 2221.
Bucchanan, George, 1435. Buchanan, George, 1435. Buchanan, James, 392, 2976. Buchanan, Robert William, 393, 920. Bucharest, Rumania, 393, 2461. Buching, James, 1587.
Buck, Dudley, 393.
Buckboard, 393, 491.
Buckeye, 393; horse chestnut, 1324.
Buckeye State, 393, 2022.
Buckingham, Cooper Villians, 202, 44 Buckingham, George Villiers, 393, 424.
Buckingham, George Villiers, 393, 424.
Buckingham, William Alfred, 393.
Buckingham Palace, 393, 1622.
Buckland, Cyrus, 393.
Buckland, Francis Trevelyan, 394.
Buckland, William, 394.
Buckle, Henry Thomas, 394.
Buckler, Simon Rollian, 394. Buckner, Simon Bolivar, 394.
Buckner, Simon Bolivar, 394.
Bucktails, 394; Tammany Society, 2812.
Buckthorn, 394.
Buckwheat, 394, 1176.
Bucyrus, Ohio, 394.
Bud, 395, 1020, 1175. Budapest, Austria-Hungary, 395, 2997. Buddha, 395, 396. Buddhism, 396; sacred city, 1580; worshipers, Budding, 396, 1175.
Buell, Don Carlos, 396, 1658, 2615.
Buena Vista, Mexico, 396, 2829.
Buenos Ayres, Argentina, 397, 137.
Buffalo, 397, 302, 2188.
Buffalo, N. Y., 397, 601.
Buffalo Bill, 617.
Buffalo Eaters, 2620.
Buffalo Gnat, 398; gnat, 1154.
Buffalo Grass, 399.
Buffalo Sucker, 2767.
Buff Leather, 399; leather, 1556.
Buffon, George Louis Leclerc, 399, 412.
Bug, 399, 258, 632, 3100.
Bugeaud, Thomas Robert, 4.
Buggy, 399, 491.
Bugle, 399; infantry, 1387.
Building. See Architecture, 132.
Building and Loan Association, 399.
Building Stone, 399, 1179.
Bukowina, 400, 195, 1086.
Bulacán, Philippines, 400; Bulb, 400, 1098, 2 Budding, 396, 1175. Bulacán, Philippines, 400; Bulb, 400, 1098, 2037.

Bulgaria, 400, 282, 2944. Bulgarian Atrocities, 401. Bulgarians of France, 55.
Bull, or Papal Bull, 401.
Bull, John, 401.
Bull, Ole Bornemann, 401, 1879, 2052.
Bull and Bear, 253.
Bulldog, 402, 811.
Bulldoze, 402, 83.
Buller, Redvers Henry, 402, 2428.
Buller, Redvers Henry, 402, 2428.
Buller, 402, 2420, 2621.
Bullfight, 402, 1671.
Bullfinch, 402, 1671.
Bullfnod, 402, 1073.
Bullhead, 506.
Bullion, 403; coinage, 620.
Bullion State, 1810.
Bullokar, John, 797. Bulgarians of France, 55. Bullokar, John, 797.
Bull Run, first battle of, 403, 1660; second battle of, 403, 2274.
Bull Run River, 403, 255.
Bull Terrier, 402, 2848.
Bull Trout, 403. Bülow, Bernhard, Count von, 403. Bülow, Friedrich, 403.
Bülow, Hans Guido von, 403.
Bulrush, 404, 2579.
Bulwer-Lytton, 1653.
Bulyea, George H. V., 55.
Bumblebee, or Humblebee, 404, 1337. Bunce, Francis Marvin, 404. Buncombe, Edward, 404, 83. Buncombe, Edward, 404, 83. Bundesrath, 404, 1128, 2326. Bungalow, 404. Bunghole, 236. Bunion, 404. Bunker Hill, 405, 604, 3114. Bunker Hill Monument, 345, 405. Bunker Hill Monument, 345, 405.
Bunsen, Baron, 3250.
Bunsen, Robert Wilhelm, 405, 546, 1101.
Bunsen Burner, 405, 1010.
Bunsen's Pile, 405.
Bunting, 405, 2058, 2666.
Bunyan, John, 405, 919.
Buoys, 406, 1587.
Burbage, Richard, 406.
Burbank, Luther, 406, 2308.
Burbot, 406.
Burdekin Riyer, 406, 2351. Burbott, 406.
Burdekin River, 406, 2351.
Burdett-Coutts, Angela Georgiana, 406.
Burdette, Robert Jones, 407, 89.
Burdock, 407, 3115.
Bureau, 407; bureaucracy, 407.
Bureau of the American Republics, 407, 2095.
Burgess, Frank Gelett, 407.
Burgess, T. J. W., 407.
Burgos, Spain, 407.
Burgos, Spain, 407.
Burgoyne, John, 408, 405, 2528.
Burgundians, 182, 284.
Burgundy, 408, 1739; wine, 3162.
Burgundy, Duke of, 538.
Burial, 408, 909; mummy, 1868; suttee, 2783.
Buriates, 409; Kalmucks, 1485.
Burke, Edmund, 409, 2225. Burke, Edmund, 409, 2225. Burke, John M., 618. Burleigh, William Cecil, 904. Burleson, Albert Sidney, 409. Burlesque, 409, 825. Burlingame, Anson, 409; Treaty, 410. Burlington, Iowa, 410, 1403. Burlington, N. J., 410. Burlington, Vt., 410, 3034.

Burma, Asia, 410, 1691. Burmans, 411. Burnand, Sir Francis Cowley, 412. Burne-Jones, Sir Edward Coley, 412. Burnand, Sir Francis Cowley, 412.
Burne-Jones, Sir Edward Coley, 412.
Burnett, Frances Eliza Hodgson, 412.
Burnham, Sherbourne Wesley, 412.
Burning Glass, 412, 131.
Burnley, England, 412.
Burnouf, Eugène, 1048.
Burns, Robert, 412, 2563.
Burnside, Ambrose Everett, 413, 1319, 1657.
Burnt Offering, 413; sacrifice, 2481.
Burr, Aaron, 413, 312, 1242, 2976.
Burrard Inlet, 414, 3017.
Burrillville, R. I., 414.
Burroughs, John, 414, 89.
Burrows, Julius Caesar, 415.
Burt, Mary Elizabeth, 415.
Burton, Sir George, 415.
Burton, Sir Richard Francis, 415.
Burton, Robert, 415.
Burton, W. E., 826.
Burton-on-Trent, England, 415.
Burwash, Rev. N., 415.
Bury, England, 415.
Busenbaum, Hermann, 798.
Bush Buck, or Boshbok, 416.
Bushel, 416, 1744. Bush Buck, or Boshbok, 416. Bushel, 416, 1744. Bushmen, or Bosjesmans, 416. Bushnell, Horace, 1606, 3247. Bushrangers, 416. Business College, 416. Business, Schools of, 873. Bust, 416; sculpture, 2568. Bustard, 416. Butcher Bird. See SHRIKE, 2622. Butler, Pa., 416. Butler, Benjamin Franklin, 417, 292, 1198. Butler, Benjamin Franklin, 41 Butler, Joseph, 417. Butler, Nicholas Murray, 417. Butler, Pierce, 2989. Butler, Samuel, 3234, 3237. Butler, Walter N., 548. Butler, William Allen, 417. Butler, William Orlando, 417. Butt, Isaac, 1408. Butte, 418, 1992. Butte, Mont. 418, 1835. Butte, Mont., 418, 1835. Butter, 418, 511, 2009, 2031; cocoa butter, 616. Butter, Nathaniel, 1473. Butter, Nationnel, 1443.
Buttercup, 418, 1021, 2374.
Butterfield, Daniel, 418.
Butterfield, Daniel, 418.
Butterfly, 419, 506, 1859.
Butterfly Weed, 419.
Butterine. See OLEOMARGARINE, 2031.
Butternut, or White Walnut, 419, 3076.
Butterwort, 420, 487.
Butterworth Benjamin, 420 Butterworth, Benjamin, 420. Button, 420, 2610. Button, Gwinnett, 2995. Buttonwood, 2230. Buttress, 420.
Butyric Acid, 420.
Buzzard, 420; turkey buzzard, 420, 3066. Buzzard, 420; turkey buzzard, 420, 3000. Buzzard's Bay, 421, 468. Byeluka, Mount, 77. Byland Abbey, Battle of, 386. By-Law, 421, 681. Byron, George Gordon Noel, 421, 920, 1810. Byzantine Architecture, 133, 422, 660.

Byzantine Art, 421. Byzantine Empire, 422, 2444, 2943. Byzantium, 423, 660, 2444.

C, 424, 1879, 2951.
Cab, 424, 689.
Cabal, 424.
Caballero, Fernan, 424.
Cabatúan, Philippines, 424.
Cabbage, 424, 512, 2009.
Cabbage Insects, 425.
Cabbage Palm, 425, 2088.
Cabbage Rose, 425; rose, 2450.
Cabinet, 425; duties of, 2991.
Cabinet Organ, 2053.
Cable, 425, 178, 426, 995.
Cable, Electric, 426.
Cable, George Washington, 426, 89.
Cable, The Atlantic, 178, 426, 994.
Cable Cars, 426, 2518.
Cable Railway, 426.
Cables, 426; submarine, 426.
Cables, 426; submarine, 426.
Cabot, George, 427, 2992.
Cabot, John, 427, 1681, 3038.
Cabot, Sebastian, 427, 1935.
Cabral, or Cabrera, Pedro Alvarez, 427, 909.
Cabul, or Kabul, 1483.
Cacao, or Cocoa, 615.
Cactus, 427, 2308. Cacao, or Cocoa, 615. Cactus, 427, 2308. Cactus, 427, 2308.
Caddice Fly, or Caddis Fly, 428, 1929.
Cade, Jack, 428, 305.
Caderike Canal, 458.
Cadet, 428, 2995.
Cadillac, Mich., 428.
Cadiz, Spain, 428, 2696.
Cadmea, 2857.
Cadmium, 428, 547, 1766 Cadmium, 428, 547, 1766. Cadmus, 428, 2584, 2857. Caecum, or Blind Gut, 3032. Caecus, Appius Claudius, 120. Caedmon, 429. Caen, France, 429. Caesar, 429, 737, 1484. Caesar, Augustus. See Augustus, 184. Cæsar, Caius Julius, 429, 436, 599, 920, 1104, 1147, 1573, 2268, 3022, 3220. Caesarea, 430, 2084, 2126. Caesarea Philippi, 430. Caesar Octavianus, 1583. Caesium, 430, 547. Caffeine, or Theine, 430, 619. Cagliari, Sardinia, 430, 2530. Cagliari, Paolo, 3036. Cagliostro, Alessandro, 431. Cahors, France, 431. Cahors, France, 431.
Caibarien, Cuba, 431.
Caicos, Islands, 431.
Cain, 431, 617.
Caine, Thomas Henry Hall, 431, 920.
Caird, Edward, 431.
Cairn, 431; stonehenge, 2750.
Cairo, Egypt, 432, 883, 1687, 1755.
Cairo, Ill., 431, 1367.
Caisson, 432, 90.
Caieput, or Caipput, 432, 2025. Cajeput, or Cajuput, 432, 2025. Cajetan, Cardinal, 1647. Calabar Bean, 433. Calabash Tree, 433. Calabria, Italy, 433, 858.

Calais, France, 433, 1338.
Calais, Me., 433, 1681.
Calamander Wood, 433; veneering, 3027.
Calamianes, Islands, 433.
Calamine, 433.
Calamus, 434; rattan, 2377.
Calash, or Caleche, 434.
Calcite, 434, 1794.
Calcium, 434, 547, 1593, 1704.
Calcium Light. See Drummond Light, 834.
Calculating Machine, 434. Calculating Machine, 434. Calculus, 434, 66, 1734. Calcutta, Bengal, 434, 1377. Calcults, 434, 66, 1734.
Calculta, Bengal, 434, 1377.
Caldecott, Randolph, 435.
Calderon de la Barca, Pedro, 435, 826.
Caledonia, 435, 2563.
Caledonia, New, 1936.
Caledonian Canal, 435, 2561.
Calef, Robert, 3171.
Calendar, 435, 74.
Calgary, Canada, 436, 55.
Calhoun, John Caldwell, 436, 2005.
Cali, Colombia, 436; Cali River, 437.
Calico, 437; dyeing, 849.
Calicut, India, 439, 1092.
California, Gulf of, 440, 1774.
California, Gulf of, 440, 1774.
California, University of, 440.
California, University of, 440.
Caligula, Caesar Augustus Germanicus, 440.
Caligh, 441; caliphate, 441.
Calisthenics, 441; physical culture, 872.
Calixtus I., 441.
Calixtus II., 441.
Calixtus III., 441.
Calixtus Georg, 441. Calixtus III., 441.
Calixtus, Georg, 441.
Calixtus, Georg, 441.
Calking, 441, 2012.
Calla, 441, 1021, 3070.
Callao, Peru, 441, 2169.
Calliope, 441, 1878, 2737.
Callisto (satellite), 1479.
Calmar, Union of, 783, 931, 1706.
Calms, Region of, 442, 3160.
Calomel, 442, 2575.
Calorific Ray, 1275.
Calorific Ray, 1275.
Calorimeter, 442; calorimetry, 1275.
Calvary, 442, 1454.
Calvary, 442, 1454.
Calvert, Cecil, 442, 1723.
Calvert, George, 221.
Calvin, John, 442, 1109, 2389.
Calvinism, 443, 449, 1978.
Calycanthus, 443.
Calycanthus, 443.
Calycanthus, 443. Calyranthus, 443, 449, 1976 Calycanthus, 443. Calypso, 443, 2958. Calyx, 443, 1020. Cam, 443; wheel, 3134. Cam, Diego, 651. Cambacéres, Lean I. 802 Cambacéres, Jean J., 802, 1895.
Cambay, Hindustan. 443, 126, 162.
Cambodia, or Camboja, Indo-China, 444.
Cambrai, or Cambry, France, 444. Cambrian, 444, 1115. Cambric, 444. Cambridge, England, 445.
Cambridge, England, 445.
Cambridge, Mass., 444, 1729.
Cambridge, Md., 444, 1723.
Cambridge, Ohio, 445.
Cambridge, University of, 445, 1583, 2997.
Cambyses, 445, 709, 2264, 2857.

Camden, N. J., 445, 1945. Camden, S. C., 446. Camel, 446, 479, 832. Camelia, 446, 219, 1021. Camelia, 446, 219, 1021. Camelopard, 447, 1143. Cameo, 447; gems, 1108, 2750. Camera Lucida, 447. Camera Lucida, 447.
Camera Obscura, 447, 2202.
Cameron, James Donald, 447.
Cameron, Simon, 448, 2726.
Cameron, Verney Lovett, 448.
Cameroon, or Kamerun, 629, 33, 1127.
Camillus, Marcus Furius, 448.
Camoens, or Camoes, Luis, 448, 2287.
Camomile, or Chamomile, 530. Camouflage, 448.
Campagna di Roma, 448, 2270.
Campagna di Roma, 448, 2270.
Campania, Italy, 448.
Campanile, Florence, 1143.
Campanili, Italo, 449; Campanula, 449.
Campbell, Alexander, 449.
Campbell, Sir Alexander, 449.
Campbell, Bartley, 449.
Campbell, Beatrice Stella Tanner, 449.
Campbell, Sir Colin, 1265.
Campbell, George Douglas, 139.
Campbell, George Douglas, 139.
Campbell, Thomas, 449.
Campbell, William Wilfred, 449, 456.
Campbell-Bannerman, Henry, 450, 167, 215.
Campbellites, 449, 575. Campbellites, 449, 575. Campbellites, 449, 575.
Campeche, or Campeachy, Mexico, 450.
Campeche, Gulf of, 450, 2834, 3212.
Camper, Pieter, 941, 966, 2206.
Camphine, 450.
Camphor, 450.
Camphor Tree, 450, 564.
Campobello, Island, 450.
Campoformica, 450. Campo formico, 450.
Campo formico, 450.
Campo Santo, 451.
Campos, Martinez, 721.
Campus Martius, 451, 2440.
Camus, Armand Gaston, 451. Camwood, or Barwood, 451. Cana, Galilee, 451. Canaan, 451, 1455. Canaanites, 451, 2084. Canaanites, 451, 1495.
Canaanites, 451, 2084.
Canaanites, 451, 2084.
Canada, Dominion of, 451; Ashburton Treaty, 161, 458; act of union, 457; animals, 453, 511; banks, 227; canals, 459, 3119; climate, 452, 603; clergy reserves, 600; commerce, 454, 640; copyright, 671; education, 454, 875, 2554; Fenians, 986; fisheries, 453, 1006; flag, 451, 1009; forests, 453, 1032; history, 456, 427, 530, 1140, 1331; immigration, 54, 455, 2534; Indians, 455, 1382; inhabitants, 455; invasion, 2566; lakes, 452, 1186, 1191, 1533, 3164; literature, 456, 1602; loyalists, 457; minerals, 453, 609; national emblem, 1020; patent, 2121; plant life, 453, 678, 2478, 3133; population, 455, 2276; productions, 453, 1019, 1079, 1644, 2506, 2638; provinces, 455; rainfall, 452, 2369; rebellion of, 1838, 2383; religion, 454; Riel Rebellion, 458, 1696, 2419; rivers, 452, 1663, 2494; settlement, 911; surtax, 731, 2819; tariff, 2819; universities, 1550, 2897, 2997. Canadian Amateur Athletic Union, 177. Canada Balsam, 458. Canada Goose, 458, 1165. Canada Hemp, 458. Canada Porcupine, 1278, 2276. Canadian River, 458.

Canadian Thistle. See Thistle, 2864. Canal, 458, 932, 1613, 1990, 2093, 2494, 2768. Canal Dover, Ohio, 459. Canal Dover, Ohio, 459.
Canaletto, Antonio, 459.
Canandaigua, N. Y., 460.
Canary, 460; yellow bird, 3203.
Canary Grass, 460.
Canary Islands, 460, 2696.
Canby, Edward Richard Sprigg, 460, 1817.
Cancellation, 460; arithmetic, 141.
Cancer, 461, 2749.
Cancer (zodiacal sign), 461, 3223.
Cancer, Tropic of, 461, 2575, 2924.
Candace, 940. Candace, 940. Candace, 640. Candahar, or Kandahar, 28, 1487. Candia, 461, 703. Candle, 461; stearin, 1010, 2736. Candleberry, or Bagberry, 461. Candlefish, 461. Candlemas, 461 Candle Nut, 461, 2025.
Candlish, Robert Smith, 1061.
Candy, 461; candy kitchen, 461.
Canella, 462.
Canine, 810.
Canis Major, 462, 2643. Canine, 610.
Canis Major, 462, 2643.
Cankerworm, 462.
Cannae, Italy, 462; Battle of, 1248, 2560.
Cannel. Coal, 462, 609.
Cannibal, 463, 1936.
Canning, 462, 463.
Canning, George, 463.
Canning, George, 463.
Canning Industry, 463, 678.
Cannon, 463, 740, 1218, 1522, 2435.
Cannon, George Q., 464.
Cannon, Joseph G., 464.
Cano, Alonzo, 464.
Cano, Alonzo, 464.
Cano, 464, 1382.
Canon, 465.
Canon City, 465.
Canony, 465.
Canova, Antonio, 465, 2570.
Canovas del Castillo, Antonio, 465.
Canrobert, Marshall François, 2143.
Canso, Nova Scotia, 465. Canso, Nova Scotia, 465. Canso, Strait of, 465, 2494. Cantabrian Mountains, 466, 2694. Cantaloupe, 1753, 1881. Cantata, 466. Canteen, 466. Canteen, 466.
Canterbury, England, 466, 548.
Canterbury Cathedral, 466.
Canterbury Tales, 543, 919.
Cantilever, 466, 372.
Canton, China, 466, 567.
Canton, Ill., 467; Canton, Ohio, 467, 2024.
Canton, John, 886.
Cantonments, 1786.
Cantonents, 1786.
Canute, or Knut, 467, 921, 2029.
Canvas, 467; weaving, 3112.
Canvasback, 467; duck, 837.
Caoutchouc, 467, 1223.
Cape Ann, 467, 1728.
Cape Arago, or Gregory, 467.
Cape Barrow, or Point Barrow, 468, 198 Cape Barrow, or Point Barrow, 468, 1985. Cape Blanco, 468. Cape Breton, 468, 1634. Cape Buffalo, 397. Cape Catoche, 468. Cape Charles, 468, 549.

Cape Clear, 468.
Cape Cod, 468, 1730.
Cape Colonna, 468.
Cape Colony, 468, 33, 1900.
Cape Comorin, 470.
Cape Diamond, 470.
Cape Farewell, 470.
Cape Fear, 470.
Cape Fear River, 470, 1990.
Cape Finisterre, or Land's End, 470.
Cape Flattery, 470.
Cape Girardeau, Mo., 470. Cape Flattery, 470.
Cape Girardeau, Mo., 470.
Cape Haitien, or Haytien, Haiti, 470.
Cape Hatteras, 470.
Cape Henlopen, 470, 776.
Cape Henry, 470, 549.
Cape Horn, 471, 2877.
Cape Horn, 471, 2877. Cape Lisburne, 471. Cape Lookout, 471. Cape May, 471, 776, 1944. Cape May, 471, 776, 1944.
Cape Mendocino, 471, 437.
Cape Nome, 471, 50.
Cape Nordkyn, 1989.
Cape of Good Hope, 471, 794.
Cape Palmas, 471, 1581.
Cape Prince of Wales, 471, 859. Cape Prince of Wales, 471, 859.
Cape Race, 471.
Capercally, or Capercailzie, 471.
Capernaum, Palestine, 471, 1086.
Capers, William, 472.
Cape Sable, 472.
Cape Sant Vincent, 472.
Cape San Lucas, 472.
Cape San Roque, 472.
Capetian Dynasty, 472, 1049, 2107, 3014.
Capeto-Cairo Railway, 472, 378.
Cape Town, Cape Colony, 473, 470. Cape-to-Cairo Railway, 472, 378.
Cape Town, Cape Colony, 473, 470.
Cape Verde, 473, 29.
Cape Verde Islands, 473, 2287.
Cape Wrath, 473.
Capillaries, 473, 3026.
Capillarity, 474.
Capital, 474, 2668.
Capital Punishment, 474, 1215.
Capitals, 475; type, 2951.
Capitoline Hill, 476, 2440.
Cappadocia, Asia Minor, 476. Capptoline 1111, 416, 2440. Cappadocia, Asia Minor, 476. Caprera, Island, 1097. Capri, Island, 476, 1893. Capricorn, 476, 2924. Capricorn, Tropic of, 476, 2575, 3224. Capricornus, the Goat, 3223. Caprivi, George Leo, 476, 1310. Capsicum, 476. Capstan, 477. Capstan, 477.
Capsule, 477.
Capsule, 477.
Captain, 477. 643, 1682, 2394.
Captivity, 750, 1457.
Capua. Italy, 477.
Capuchins, 477, 1824.
Capybara, 477, 514.
Car, Pullman, 2333.
Carabao, 397, 2188.
Caracal, 477; lynx, 1650.
Caracalla, Marcus Aurelius, 477, 586.
Caracac, Venezuela, 478, 1532.
Caracci, or Carracci, 478.
Caraccioli, Francesco, 478.
Carat, 478, 1160.
Caravaggio, Michelangelo Amerighi, 4 Caravaggio, Michelangelo Amerighi, 478.

Caravel, or Caravella, 478, 636. Caravan, 478, 2921, 3015. Caraway, 479; oil of, 479, 2025. Carbazotic Acid, 478, 2023.
Carbazotic Acid, 478.
Carbohydrates. See Starch, 2726; Sugar, 2769.
Carbolic Acid, 479, 2817.
Carbon, 479, 547, 793; coal, 609; diamond, 793; electric light, 893; lampblack, 1536. Carbonate, lime, 1593; soda, 2670.
Carbonates, 479.
Carbonic Acid, or Carbon Dioxide, 479, 747.
Carbonic Oxide, 480.
Carboriferous, 480, 35, 1115.
Carborundum, 480.
Carborundum, 480.
Carborundum, 480. Carbuncle, 481. Carcinoma (cancer), 461. Cardan, Jerome, 765. Cárdenas, Cuba, 481, 720. Cardiff, N. Y., 481. Cardiff, Wales, 481. Cardiff Giant, 481. Cardigan, Lord, 213. Cardinal, 481, 2273. Cardinal Flower, 481. Cardinal Virtues, 481. Cards, 481; cassino, 499; euchre, 944; solitaire, 2672; whist, 3138. Carducce, Giosué, 482, 1422. Carducce, Glosue, 462, 1422. Carey, Henry, 482, 1157. Carey, Henry Charles, 482. Carey, William, 482. Caribales, 463. Carib, 482; Caribs, 1012. Caribbean Sea, 482, 2681. Cariboo Mountains, 53. Caribou, 482, 771. Caricature, 482. Caricature, 482.
Carillân Falls, 2066.
Carleton, Sir Guy, 482.
Carleton, William, 483, 88.
Carleton, William, 483, 88.
Carlisle, England, 483.
Carlisle, Pa., 483.
Carlisle, John Griffin, 483.
Carlists, 65.
Carloman, 483, 535, 2155. Carloss, 65.
Carloman, 483, 535, 2155.
Carlos, Don Carlos Juan, 483, 1416, 2698.
Carlos, Maria, 483, 535, 2155.
Carlovingian, 483, 1130.
Carlsbad, or Karlsbad, Bohemia, 484. Carlsbad, of Karlsbad, Bonema, 484.
Carlsruhe, or Karlsruhe, Germany, 484.
Carlstadt, Andreas, 484.
Carlyle, Thomas, 484, 920.
Carmack, Edward Ward, 485.
Carmack, George, 1514.
Carman, Bliss, 485, 456.
Carmel, 485, 935.
Carmelites, 485, 1756, 1825. Carmelites, 485, 1756, 1825. Carmen Sylva, 536, 903, 2327. Carmine, 485, 614. Carnation, 485, 2219. Carnauba, or Brazilian Wax, 3108. Carnegie, Pa., 485. Carnegie, Andrew, 485, 486. Carnegie Institution, 486, 3092. Carnelian, or Cornelian, 486, 35, 2635, 2750. Carnival, 486, 1705. Carnivora, 486. Carnivorous Plants, 487, 420, 2223, 3030. Carnot, Lazare Nicolas Marguerite, 487. Carnot, Marie, 487, 1050.

Carnot, Nicholas Léonard Sadi, 1116. Carnot, Nicholas Léonard Sadi, 1116. Carob, or Locust, 487, 1615. Carolina, Maria, 487, 988. Caroline, Amelia Elizabeth, 487, 382. Caroline, of Brunswick, 382, 487. Caroline Islands, 488, 629, 1127. Carolingians, 488, 535. Carotid Arteries, 488, 2356. Carp, 488, 1005, 2766. Carpathian Mountains, 488. Carnel, 489: flower, 1020. Carpathian Mountains, 488.
Carpel, 489; flower, 1020.
Carpentaria, Gulf of, 489, 168.
Carpenter, Mary, 489.
Carpenter, Matthew Hale, 489.
Carpenter, William Benjamin, 489.
Carpenter Bee, 489; bee, 258.
Carpenter Birds, 299.
Carpentry, 489; architecture, 132.
Carpet, 490, 484, 1640; felt, 985; linoleum, 1598.
Carpetbaggers, 490, 2260.
Carpetbag Government, 490, 2385. Carpetbag Government, 490, 2385. Carpetbag Government, 490, 2385.
Carpet Beetle, 490.
Carracci. See Caracci, 478.
Carrageen, 66, 1409.
Carranza, Venustiano, 490, 1776.
Carrara, 490; marble, 1704.
Carrara Marble, 490, 1704.
Carrel, Armand, 1144.
Carrera, Rafael, 1212. Carrei, Armand, 1144,
Carrera, Rafael, 1212.
Carriage, 490, 609; Carrier, 491.
Carrier Pigeon, 491, 821, 2212.
Carroll, Charles, 492, 769, 2995.
Carroll, Daniel, 2989.
Carroll, John, 492; Carroll, Lewis, 810.
Carrot, 492, 2363, 2958.
Carson, Christopher, 492. Carson, Christopher, 492. Carson, Sir Edward, 492. Carson City, Nev., 492, 1931. Carson River, 493, 1414. Cart, 493, 399. Cartagena, of Carthagena, Colombia, 493. Cartagena, Spain, 493. Carthage, Mo., 493, 1813.
Carthage, Mo., 493, 1813.
Carthage, Mo., 493, 1813.
Carthage, 493, 797, 1248, 1262, 2392, 2934, 2953, 3007, 3018.
Carthage, 404, 2520 Carthaginians, 494, 2530. Cartinaginians, 494, 2530.
Carthusians, 494, 1824.
Cartier, Sir George Etienne, 495.
Cartier, Jacques, 495, 457, 2350.
Cartilage, or Gristle, 495, 332.
Cartoon, 495.
Cartilage, 405. Cartoon, 495.
Cartridge, 495; gun, 1218.
Cartwright, Edmund, 495, 1627.
Cartwright, Peter, 495, 1595.
Cartwright, Sir Richard John, 496.
Carver, John, 496, 2214.
Carving, 496, 3177.
Cary, Alice, 496, 89; Cary, Phoebe, 496, 3237.
Caruso, Enrico, 496.
Casas. See Las Casas. 1546.
Cascade Mountains, 496, 1987, 2049. Cascade Mountains, 496, 1987, 2049. Cascade Tunnel, 496. Cascarilla, 496, 900. Casco, Plateau of, 98. Casco, Plateau of, 98. Casco Bay, 496, 1678. Case, 497, 2001, 2320. Casein, 497, 545, 1787; Casey, Silas, 970. Casement, Sir Roger, 497. Cashew, 497; sumac, 2774.

Cashmere, or Kashmir, 497.
Cashmere Goat, 497, 1156.
Cashmere Shawl, 499, 2606.
Cash Register, 497; calculating machine, 434.
Casimir-Perier, Jean Paul Pierre, 497, 1050.
Caspian Sea, 498, 2467.
Cass, Lewis, 498, 531, 2829.
Cassander, 2507, 2857.
Cassandra, 498, 1277.
Cassand, 1taly, 20.
Cassatt, Alexander Johnston, 498.
Cassava, or Manioc, 2817, 3126.
Cassel, of Kassel, Germany, 499.
Cassin, 499, 2587.
Cassimere, 499.
Cassini, Giovanni, 499, 1563. Cassini, Giovanni, 499, 1563. Cassino, 499, 482. Cassino, 499, 402. Cassiopeia, 499. Cassiquiari River, 499, 80, 2054. Cassius Longinus, Caius, 499, 430. Cassowary, 500, 298. Cast, 500; gypsum, 1225. Castaigne, Andre, 500. Castalia, Fountain, 500, 2112. Caste, 500, 357, 2783. Castelar, Emilio, 500. Castellamare, Italy, 501. Castellamare, Gulf of, 501, 2627. Castellamare del Golfo, Sicily, 501. Castelli, Benedetto, 2899. Castiglione, Baldassare, 501.
Castile, 501, 2697.
Castilho, Antonio Feliciano, 2287.
Casting, 501.
Cast 170, 501, 1410. Cast Iron, 501, 1410.
Castle, 501.
Castle, 501.
Castle Garden, 501, 1959.
Castle Hill, 870.
Castlereagh, Robert Stewart, 501, 2771.
Castor and Pollux, 502, 139, 1544.
Castor Oil Plant, 502; oil, 2025.
Castro, Capriano, 502.
Cast Steel, 2736.
Cat, 502; Angora, 503; tailless, 503.
Catacombs, 503, 2106.
Catalan Furnaces, 1410.
Catalani, Angelica, 504.
Catalepsy, 504; hysteria, 1354.
Catalonia, 230, 1410.
Catalonians, 2695. Catalonians, 2695. Catalpa, 504. Catamaran, 504. Catamia, Sicily, 504, 858. Catania, Gulf of, 2627. Cataplasm, 504. Catapult, 504. Cataract. See WATERFALL, 3101. Cataract, 504, 312. Catarrh, 505. Catastrophism, 1114. Catastrophism, 1114.
Catawba, 505.
Catawba Brandy, 360; grapes, 1182.
Catawba River, 505.
Catbird, 505.
Catechism, 505.
Category, 505.
Catenary Curve, 505.
Caterpillar, 506, 419, 1859.
Catesby, Robert, 1221.
Catfish, 506, 889.
Catgut, 506, 3051.
Catharine I., 507, 2173. Catharine I., 507, 2173.

Catharine II., 507, 706, 2173. Catharine de Medici, 507, 537, 623, 1334. Catharine Howard, 508, 1287. Catharine of Aragon, 508, 1287, 3175. Catharine of Braganza, 536. Catharine Parr, 508, 1287. Catharists of Germany, 55.
Cathedral, 508, 116, 251, 466, 626, 846, 907, 931, 958, 1015, 1152, 1567, 1593, 1772, 1785, 1816, 2000, 2441, 2504, 2597, 2631, 2756, 2891, 3182.
Catherwood, Mary Hartwell, 508. Cathetometer, 508.
Cathode Ray, 508, 896.
Catholic Church, 508; Begging Friars, 1052;
Dominicans, 815; fast, 1569; feasts, 991;
Franciscans, 1052; Jesuits, 1452, 1641, 2796, 3149; Lent, 1569; Nicean Council, 659; Pope, 2272; rosary, 252; Sisters of Charity, 534; Ursulines, 3002; Vatican Council, 3023; Vatican library, 1583, 2441, 3023.
Catholic Emancipation, 509, 2087, 3120.
Catholic Knights of America, 274.
Catholic League, 1222, 2863, 2879.
Catholic Mutual Benefit Association, 274.
Catholic University of America, 509. Cathetometer, 508. Catholic University of America, 509. Catholic Young Men's National Union, 509. Catiline, Lucius Sergius, 509, 580. Catiline, Lucius Sergius, 509, 580.
Catilsland, 509.
Catlettsburg, Ky., 509.
Catlin, George, 509.
Catnip, or Catmint, 509, 219, 1803.
Cato, Marcius Porcius, 509, 580.
Cato, Marcius Porcius, of Utica, 510.
Cats, Jakob, 510, 1927.
Cat's-Eye, 510.
Catskill, N. Y., 510.
Catskill, Nountains, 510, 1956.
Cattegat, or Kattegat, Gulf, 511, 2645, 2679.
Cattle, 511, 2301, 2373, 2960.
Catullus, Gaius Valerius, 512.
Cauca River, 512, 626.
Caucasian, 512, 941.
Caucasus Mountains, 512, 162, 585.
Caucus, 512, 83.
Cauliflower, 512, 424.
Caustic, 512, 78.
Cavalier, 512. Cavalier, 512.
Cavaliere, Emilio del, 2384.
Cavalry, 512, 150, 2806.
Cave Dwellers, 513, 2922. Cave Dwellers, 513, 2922.
Cavendish, Frederick Charles, Lord, 513.
Cavendish, Henry, 513, 545.
Cavendish, Sir Thomas, 513.
Caves, 513; Luray Cave, 1646; Mammoth Cave, 1688; Wyandotte Cave, 3190.
Cavite, Philippines, 513.
Cavour, Camillo Benso di, 513, 96.
Cavy, 514, 1216.
Cawnpore, India, 514, 1265.
Caxton, William, 514, 290, 2313.
Cayenne, Guiana, 514, 1214.
Cayenne Pepper, 476, 2707.
Cayman (spectacled), 73.
Cayuga Indians, 514.
Cayuga Lake, 514, 1617, 1956.
Cebú, Philippines, 514, 2187.
Cecil, William, Lord Burleigh, 515.
Cecrops, 176, 901.
Cedar, 515, 1557.
Cadar, Craek, 515, 2619. Cedar, 515, 1557. Cedar Creek, 515, 2612. Cedar Falls, Iowa, 515, 1402.

Cedar Lake, 515. Cedar Mountain, 516. Cedar Rapids, Iowa, 516, 1403. Cedar Rapids, or The Cedars, Quebec, 516. Cedar Rapids, or 1 ne Cedars, Quebec, 516.
Cedar River, 516, 538.
Celling, 516.
Celebes, 516.
Celes, 516.
Celesting, 517, 2958.
Celestial Sphere, 517.
Celestine, 517, 2273.
Celibacy, 517, 396, 2006, 2308, 2438.
Cellini, Benevenuto, 517, 1422.
Cells, 517, 2204, 2232, 2401.
Cellular Tissue, 517.
Celluloid, 517, 420.
Celluloid, 517, 420.
Cellulose, 517.
Celsius, Anders, 520, 2787.
Celsus, 95, 198.
Celts, 518, 1104, 2697, 2850.
Cement, 518, 647.
Cemetery, 518, 702, 1916.
Cenci, Beatrice, 519.
Cenis, Mount, 519, 76.
Cenozoic, or Tertiary, Age, 519, 35, 1115.
Censer, 519; incense, 1372.
Censor, 519.
Census, 519, 2074, population, 2075, 2001. Cedar River, 516, 538. Censer, 519; incense, 1572. Censor, 519. Census, 519, 2974; population, 2275; population, center of, 2276. Cent, 519, 620, 812. Centaurs, 520, 1924. Centaurs, 520, 570, 1291. Centennial Exposition, 520, 2184. Centennial State, 632. Center of Gravity, 520; gravity, 1184. Centerville, Iowa, 520. Centigrade, 520, 2806. Centigrate, 520, 2801.
Centimeter, 1770, 2962.
Centipede, 520.
Central Africa, 520.
Central America, 520, 1988.
Central Falls, R. I., 521, 2409.
Centralia, Ill., 522.
Centralization, 522. Centralization, 522. Central Park, N. Y., 522, 1960. Central Time, 2722. Centrifugal and Centripetal, 522, 1030. Century, 522.
Cephalonia, or Kephallenia, Island, 522.
Cephalopoda, 522, 1822. Cepheus, 499. Ceram, or Zeram, Island, 523, 1823. Ceramic Art, 523. Cerealia, 523, 991. Cereals. See Grain, 1176. Cerebellum, 523, 358. Cerebration, Unconscious, 523. Cerebrum, 523, 358. Ceres, 523, 172, 901. Cereus, 523, 428. Cerium, 523, 547. Cerro Gordo, Battle of, 523, 2566. Certificate, 523. Ceruse, 523. Cervantes Saavedra, Miguel de, 524, 2696. Cervera y Topete, Pascual de, 524, 2699. Cervin, Mont, 1735. Cetacea, 524; narwhale, 1898. Cetewayo, 3226. Cette, France, 524. Ceuta, Morocco, 524.

Cévennes Mountains, 524. Ceylon, Island, 525, 1381, 3024. Chachapoyas, 80. Chad Lake, 2929. Chadbourne, Paul Ansel, 525. Chadwick, George Whitfield, 525. Chadwick, John White, 525. Chaeronea, Battle of, 57, 2185. Chaffee, Adna Romanza, 525. Chafin, Eugene W., 2261. Chafra, 2339. Chagos, Archipelago, 526. Chagres, Panama, 526. Chagres River, 526, 2094. Chaillu. SEE DU CHAILLU, 836. Chain, 526, 1221. Chain, in machinery, 526. Chain, in machinery, 526. Chaise, 526; calash, 434. Chalcedon, Asia Minor, 526. Chalcedon, Creed of, 701. Chalcedony, 526, 35, 2346, 2635. Chalcis, Greece, 526, 141. Chaldaea, 526, 204, 2584. Chaldee Language, 526, 127. Chaleurs Bay, 527, 1934. Chalice, 527 Chalice, 527, 2809.
Chalk, 527, 2809.
Chalkhill, John, 3079.
Challenger Expedition, 527.
Chalmers, George, 697.
Chalmers, Thomas, 527, 1061. Chalmette, Battle of, 1950, 3085. Chalons, Battle of, 181, 248, 1340. Chalons, Battle ot, 181, 248, 1340. Châlons-sur-Marne, France, 527. Châlons-sur-Saône, France, 528. Chamber, 528, 320, 1046. Chamberlain, Jacob, 528. Chamberlain, Joseph, 528. Chambers, Ephraim, 528. Chambers, William, 528. Chambers, William, 528. Chambers, William, 528. Chambers, William, 529. Chambersburg, Pa., 529. Chambersourg, Pa., 529.
Chamber's Encyclopaedia, 528, 914.
Chambly, Quebec, 529.
Chambord, France, 529.
Chambord, Comte de, 529.
Chameleon, 529, 1612.
Chaminade, Cécile Louise Stéphanie, 529. Chamois, 529, 111 Chamomile, 530, 2025, 2894. Chamouni, or Chamonix, France, 530. Champagne, 530, 3162. Champaign, Ill., 530. Champ de Mars, 530, 2107. Champlain, Lake, 530, 1117. Champlain, Samuel de, 530, 457, 1958. Champollion, Jean François, 531, 1569. Champs Elysées, 531, 130. Chancellor, 531, 2111. Chancellorsville, Va., 531, 1561. Chandler, Charles Frederick, 531. Chandler, William Eton, 531. Chandler, Zachariah, 531. Chang and Eng, 2625. Chang-Chou, China, 531. Channel, English, 532. Channel Islands, 532, 923. Channing, William Ellery, 532, 1239, 2962. Chantilly, France, 532. Chantilly, Va., 532. Chantrey, Sir Francis, 532.

Chanute, Kan., 532. Chanute, O., 1024. Chaos, 532; creation, 855. Chapala, Lake, 532. Chaperon, 532. Chaplain, 533. Chapleau, Sir Joseph Adolphe, 532. Chapman, George, 533. Chapultepec, 533, 2566. Char, 1005. Charade, 533. Charcoal, 533, 2769. Charcot, Jean Martin, 533. Charente River, 534, 1045. Chares of Lindus, 633. Charge d' Affaires, 802. Chariot, 534, 586, 2343. Charity, Sisters of, 534; nun, 2006. Charity Organizations, 534. Charivari, 534, 1104, 2423. Charlemagne, 534, 483, 880, 950, 1049, 1130, 1241, 1570, 1620, 2437. 1570, 1620, 2437.
Charleroi, Pa., 535.
Charles (monarchs), 535.
Charles I., of Rumania, 535, 2462.
Charles I., of England, 536, 393, 710, 869, 922, 2458, 2463, 2565, 2755, 3020.
Charles II., of England, 536, 424, 710, 2149, 2565.
Charles II., of Spain, 1632.
Charles IV., of Spain, 2148.
Charles IV., of Germany, 484.
Charles IV., of Germany, 536, 1131, 1737, 2697.
Charles V., of Germany, 537, 2698.
Charles VI., of Germany, 537, 2698.
Charles VI., of France, 535.
Charles VI., of France, 537.
Charles VI., of France, 537.
Charles VII., of France, 537, 1459, 2300.
Charles VIII., of France, 537, 1739.
Charles XII., of France, 537, 1633.
Charles XI., of Sweden, 2788.
Charles XII., of Sweden, 2788.
Charles XIII., of Sweden, 283, 2788.
Charles XIV., of Sweden, 538, 1742.
Charles XIV., of Sweden, 588.
Charles Cape, 468.
Charles Cape, 468.
Charles City, Iowa, 538.
Charles Martel, 538, 483, 535.
Charles of Anjou, 2627, 2628.
Charles of Austria, 904.
Charles River, 538.
Charles River, 538.
Charles River, 538.
Charles River, 538.
Charles River, 538. Charleroi, Pa., 535. Charles River, 538. Charles River, 538.
Charles the Bold, of Burgundy, 538, 408.
Charleston, Ill., 539.
Charleston, S. C., 539, 858.
Charleston, W. Va., 539, 3130.
Charlotte, N. C., 540, 1992.
Charlottenburg, Germany, 540, 281. Charlottenburg, Germany, 540, 281.
Charlotte Sophia, 1117.
Charlottesville, Va., 540, 1839.
Charlottetown, Prince Edward Island, 540.
Charnel House, 540, 718.
Charon, 540, 14, 2765.
Chart, 540; map, 1702.
Charter, Great, 1674, 1339, 1540.
Charterhouse, 541, 20, 860, 1207, 1561, 2737, 2853, 3192. 3122. Charter Oak, 541, 1260. Chartres, France, 541. Charybdis. See Scylla and Charybdis, 2570. Chase, Salmon Portland, 541.

Chase, Samuel, 541, 2995. Chat, 541; whinchat, 541. Chateaubriand, François, René Auguste, 541. Chatham, Earl of, 542, 2224. Chatham, England, 542. Chatham, New Brunswick, 542. Chatham, Ontario, 542, 2040. Chatham Islands, 542. Chati, 2878, 3147. Chati, 2878, 3147.
Chattahoochee River, 542, 1014.
Chattahooga, Tenn., 542, 2844.
Chattel, 543; estate, 938.
Chatterton, Thomas, 543, 2771.
Chaucer, Geoffrey, 543, 919, 2245.
Chaudiére Falls, 543, 2066.
Chaudiére Lake, 543; Chaudiére River, 543.
Chauffeur, 544.
Chautanga, N. V. 544. Chautauqua, N. Y., 544.
Chautauqua Literary and Scientific Circle, 544.
Cheboygan, Mich., 544.
Check, 544, 293, 598.
Checkered Beetle, 263. Checkers, 544; chess, 549. Cheduba, Island, 544. Cheese, 545, 497, 1787. Cheese Fly, 545. Chelsea, England, 545. Chelsea, Mass., 545, 1729. Cheltenham, England, 545. Chelyuskin, Cape, 164, 1983. Chemical Affinity, 29, 28. Chemistry, 545, 56, 180, 405, 975, 1585.
Chemistry, 545, 56, 180, 405, 975, 1585.
Chemnis, Egypt, 15.
Chemnitz, Germany, 547, 1128.
Chemnitz, Martin, 547.
Chenab River, 547.
Cheops, 547, 884, 2339.
Chephren, of Egypt, 547, 884.
Cher River, 547.
Cherbourg, France, 547, 366.
Cherbuliez, Charles Victor, 548.
Cherokees, 548, 2028.
Cherot, 581, 2888.
Cherry, 548, 3162.
Cherry, Laurel, 548, 1549.
Cherry Valley, 548.
Chersonesus, 549.
Cherubimi, Marie Luigi, 549.
Cherubini, Marie Luigi, 549.
Cherusci, 549, 148.
Chesapeake, The, 549.
Chesapeake, The, 549.
Chesapeake, The, 549. Chesapeake, The, 549.
Chesapeake and Ohio Canal, 549.
Chesapeake Bay, 549, 2074.
Chesapeake Incident, 1447.
Chess, 549; checkers, 544.
Chest, or Thorax, 550, 5, 2411.
Chester, England, 550.
Chester, Nova Scotia, 550.
Chester, Pa., 550.
Chester, S. C., 550.
Chesterfield, England, 550.
Chesterfield, Philip Dormer Stanhope, 550.
Chestnut, 551, 2008. Chestnut, 551, 2008. Cheviot Hills, 551, 2561. Chevy Chase, 551, 2067. Cheyenne, Wyo., 551, 3193. Cheyenne Indians, 551. Chiaroscuro, 551. Chica, 552 Chicago, Ill., 552, 766; library, 554; fire, 555; Fort Dearborn; 555, 766; exposition, 3183.

Chicago, University of, 556, 2997. Chicago Drainage Canal, 555, 459, 1808. Chickadee, 2885. Chickahominy River, 556, 970. Chickamauga, Battle of, 557, 2612. Chickamauga River, 557. Chickasaw Bluffs, Battle of, 557. Chickasaw Indians, 557, 2028. Chickasha, Okla., 557. Chickering, Jonas, 557. Chico, Cal., 557. Chicopee, Mass., 558. Chicory, or Succory, 558, 619. Chi-Hoang-Ti, 558. Chihuahua, Mexico, 558. Chilblain, 558. Child, Lydia Maria, 558. Child, Lydia Maria, 558.
Childeric, 2155.
Children, Societies for, 558.
Children, Song of the Three Holy, 118, 289.
Children's Crusade. See Crusades, 716.
Childs, George William, 558, 2757.
Child Study, 558, 1352.
Chile, 559, 174, 328.
Chileab, 7.
Chillán, Chile, 561, 560.
Chillicothe, Mo., 561, 1813.
Chillicothe, Ohio, 561.
Chillon, Switzerland, 561. Chillon, Switzerland, 561. Chiloé, Chile, 561. Chiloé, Chile, 561.
Chilon of Sparta, 2595.
Chimaera, 561, 270, 899.
Chimborazo, Mountain, 562, 867.
Chime, 562, 269.
Chimney, 562; smoke, 2661.
Chimney Swallow, 2784.
Chimpanzee, 562, 116.
China Sea, 562, 162, 563.
Chincha Islands, 1211.
Chinch Bug, 563, 1393.
Chinchilla, 563.
Chinese Republic, or China, 563. Chinese Republic, or China, 563, 173, 1110, 1221, 1441, 3071, 3280. Chinese Exclusion, 569. Chinese Stinkpot, 1196. Chinese Wall, 569, 558, 2141. Chinese Wax, 3108. Chinese Wax, 3108.
Chingtu, China, 569.
Chinook Indians, 569.
Chinook Winds, 377, 569, 3160.
Chipmunk, 569; squirrel, 2719.
Chippewa, Battle of, 569, 383.
Chippewa Falls, Wis., 570.
Chippewas, 570, 2025.
Chiromancy or Palmistry 2088 Chippewas, 570, 2025.
Chiromancy, or Palmistry, 2088.
Chiron, 570; Centaur, 520.
Chisel, 570, 489.
Chitine, 156.
Chiton (dress), 830.
Chiton, 570; mollusca, 1820.
Chittenden, Russell Henry, 570.
Chivalry 570, 2813, 2904. Chivalry, 570, 2813, 2904. Chivalry, Age of, 570. Chloral, 570; poison, 2246. Chloride of Sodium, 571, 2507; of lime, 571; Chloride of Sodium, 571, 2507; of chlorides, 1766.
Chlorine, 571, 547, 898.
Chloroform, 571, 94, 2639.
Chlorophyll, 571, 630, 2233.
Choate, Joseph Hodges, 571.
Choate, Rufus, 571, 87, 1605, 2047.

Chocolate. See Cocoa, 615. Choctaw Indians, 571, 2028. Choczim, or Kotzim, 1461. Choir, 572, 578. Choiseul-Amboise, Étienne François, 572. Choke Damp, 572, 480, 747. Cholera, 572, 2863. Cholera, Malignant, 572. Cholula, Mexico, 572. Chopin, Fréderic François, 572, 1879. Choppers, Order of, 274. Chopstick, 573. Choragus, 573. Chord, 573, 1888. Chorus, 573, 2047. Chosen Friends, Order of, 274. Chouans, 573. Chowan River, 53. Christ, 573; trinity, 1156; Jesus Christ, 1453; mother of, 1720; miracles, 1804. Christian IV., of Denmark, 573, 784, 878. Christian X., of Denmark, 784, 1060. Christian Catholic Church, 574. Christian Endeavor, United Society of, 574, 594. Christian Era, 574, 1453. Christiania, or Kristiania, Norway, 574, 1999. Christiania, or Kristiania, Norway, 314, 133 Christianity, 575; cross, 713; crusades, 716. Christians, 575, 449. Christian Science, 575, 869. Christian, of Sweden, 575, 2788. Christina, of Sweden, 575, 2788. Christmas, 576, 991, 1311. Christmas Island, 576. Christmas Rose. See Hellebore, 1281. Christopher, Saint, 576, 2901. Christopher's, Saint, or Saint Kitts, Island, 576 Christ's Hospital, 576. Chromatic, 576; chromatic scale, 1880. Chromatics, 576; chromatic scale, 1880.
Chromatics, 576.
Chromium, 576, 547, 1766.
Chromo-Lithography. See Lithography, 1607.
Chronicles, 577, 289.
Chronograph, 577.
Chronology, 577; calendar, 435.
Chronometer, 577, 606.
Chrysalis, 577, 419, 506.
Chrysalis, 577, 419, 506. Chrysanthemum, 577. Chrysolite, 577. Chrysorase, 577. Chrysostom, John, Saint, 578. Chrysler's Field, Ontario, 578. Chub, 578; carp, 488. Chulalonkorn I., 2624. Chuquisaca, Bolivia, 578, 2766. Church, 578, 228, 300, 652, 1196, 1647, 1769, 1806, 2200, 2337, 2344, 2962, 2996. Church, Frederick Edwin, 578. Churchill, Randolph Henry Spencer, 579, 374. Churchill, Winston, 579, 1711. Churchill, Winston Leonard Spencer, 579. Churchill River, 579, 54. Church of the Brethren, 843. Churn, 579, 418, 1787. Churubusco, Mexico, 579, 2566. Chusan Islands, 579. Chusan Islands, 579. Chyle, 579, 799, 2208. Chyme, 799, 2748. Cialdini, Enrico, 579.

Cibber, Cooley, 580, 1548. Cicada, 580; locust, 1615. Cicero, Marcus Tullius, 580, 429, 509, 2445. Cid, The, 581, 2696. Cider, 581, 121, 360. Cienfuegos, Cuba, 581, 720. Cigar, 581, 2220, 2888. Cigarette, 581. Cilia, 581, 854, 2906. Cilicia, Asia Minor, 581, 754. Cimabue, Giovanni, 581. Cimbri, 582, 1104, 2850. Cimmerii, or Cimmerians, 2204. Cimon, 582, 1791, 2159. Cinchona, 582, 2170, 2356. Cincinnati, Ohio, 582, 2974. Cincinnati, Society of, 584. Cincinnati, University of, 584, 583. Cincinnatus, Lucius Quintius, 584. Cineraria, 584. Cinra Sol. Cinna, Lucius Cornelius, 584, 1710. Cinnabar, 584, 1760, 3032. Cinnamon, 584, 2025, 2707. Cinnamon Vine, 3200. Cintra, Piedro de, 2631. Cipher, 584, 718. Circaea, 1975. Circassia, Russia, 585. Circassia, Russia, 585. Circassians, 585. Circe, 585, 2643, 2957. Circle, 585, 729, 1758. Circle City, Alaska, 50. Circleville, Ohio, 585. Circulation, 585, 1262, 1274, 2333. Circumference, 585, 772. Circus, 586, 234. Circus Maximus, 2441. Cirriped, 232. Cirrus Clouds, 607. Cisalpine Republic, 586, 1873. Cistercians, 586, 283, 1824. Cistercians, 586, 283, 1824. Cistercians, 580, 283, 1824. Cistern, 587, 999. Citadel, 587; kremlin, 1522. Cities of Refuge, 587. Citizen, 587, 69, 1905. Citizenship, 587, 1905. Citric Acid, 587, 15. Citron, 587. Citrus, 587, 2600. Citrus, 587, 2600.
City, 588; municipal ownership, 1871.
Ciudad Bolivar, Venezuela, 588.
Ciudad Real, Spain, 588.
Ciudad Victoria, Mexico, 588.
Civet, 588, 2096, 2158.
Civic Societies, 1062, 1515, 2018, 2492, 2840.
Civilization, 588; crime, 704; government, 1172.
Civil Service, 589, 780.
Civil War, in America, 589, 2981; Andersonville, 98; battles, 112, 218, 403, 516, 531, 542, 557, 622, 676, 970, 1008, 1035, 1037, 1060, 1084, 1134, 1686, 1816, 1874, 2375, 2615, 2714, 3042.
Civil War, in England, 536, 710, 869, 921, 1335, 1717. 1717. Claffin, Horace Brigham, 591. Claiborne, William, 591, 1723. Claiborne, William Charles Cole, 592. Clairvoyance, 592, 1764. Clam, 592, 303, 1822. Clan, 592; classes of, 592. Claosaurus Annecteus, 800. Clapp, Moses Edwin, 592.

Clapperton, Hugh, 592. Claremont, N. H., 593. Clarendon, Constitutions of, 593. Clarendon, Edward Hyde, 593. Clarendon, George William, 593. Clarinet, or Clarionet, 593. Clark, Abraham, 2995.
Clark, Alvin, 593.
Clark, Alvin Graham, 593.
Clark, Champ, 594.
Clark, Charles Heber, 594, 2327.
Clark, Francis Edward, 594, 574.
Clark, George Rogers, 594, 583.
Clark, Jonas, 594.
Clark, Latimer, 594.
Clark, William, 594, 1578.
Clark, William Robinson, 595.
Clark, William Robinson, 595, 618.
Clarke, Charles Cowden, 595. Clark, Abraham, 2995. Clark, William Andrews, 595.
Clark, William Robinson, 595, 618.
Clarke, Charles Cowden, 595.
Clarke, James Freeman, 595.
Clarke's Fork River, 595.
Clarkson, Thomas, 3146.
Clark's Standard Cell, 594.
Clarksville, Tenn., 595, 2844.
Clark University, 595, 3182.
Classics, 595, 2439; classicus, 595.
Claude Lorraine, 595.
Claudius, Tiberius, 596, 1922.
Claxton, Philander P., 383, 875.
Clay, 596; aluminum, 78; brick, 369; fire, 609; kaolin, 1493; pottery, 2295; soil, 2671.
Clay, Alexander Stevens, 596.
Clay, Cassius Marcellus, 596.
Clay, Cassius Marcellus, 596.
Clay, Henry, 597, 19, 1429, 2373, 2730.
Clayborne, William, 1723.
Clayton, John Middleton, 597.
Clayton, Powell, 597.
Clayton-Bulwer Treaty, 597, 1271.
Clearfield, Pa., 598.
Clearing House, 598, 226.
Cleavage, 598, 1467.
Cleaveland, Benjamin, 1511.
Cleaveland, Moses, 601.
Cleburne, Tex., 598.
Clematis, 598.
Clemenceau, Eugene, 598.
Clemenceau, Eugene, 598.
Clemencesu, Eugene, 598. Clemenceau, Eugene, 598. Clemenceau, Eugene, 598.
Clemens, Samuel Langhorne, 598, 89, 3083.
Clement (popes), 599, 2273.
Clement I., 599, 2273.
Clement IV., 3000.
Clement IV., 3000.
Clement VI., 199, 2273.
Clement VII., 507, 3001.
Clement IX., 596. 2274.
Clement XII., 599, 2274.
Clement XIII., 599, 2274.
Clement XIV., 599, 2274.
Clement XIV., 599, 2274.
Cleobulus, 2595.
Cleon. 1972. Cleon, 1972. Cleopatra, 599, 17, 115, 2953. Cleopatra's Needles, 600, 1960. Clepsydra, or Water Clock, 600. Clermont, The, 1078, 1964. Clergy Reserves, 600.
Cleveland, Ohio, 600, 2974.
Cleveland, Elizabeth, 3256.
Cleveland, Grover, 601, 2976, 3029.
Clevenger, Shobal Vail, 602, 2570. Click Beetle, 602, 3167. Cliff, 602; erosion, 934. Cliff-Dwellers, 602, 2330.

Clifford, Nathan, 602. Climate, 602; signals, 2632, 3110. Climbing Plants, 1425, 1851, 3177. Clinch River, 1314, 2842, 2844. Clingman, Thomas Lenier, 603. Clinton, Iowa, 603, 1403. Clinton, Mass., 603. Clinton, Mo., 603. Clinton, De Witt, 604, 933. Clinton, Fort, 604. Clinton, George, 604, 2976. Clinton, Sir Henry, 604, 405, 680, 2338. Clinton, James, 604. Clio, 604, 1878. Clive, Robert, Lord, 604, 1377, 2771. Clock, 605; dial, 793, hourglass, 1328; pendulum, 2146; watch, 3099. Clodius Albinus, 2596. Cloiter, 606.
Cloquet, Minn., 606.
Cloth. See Weaving, 3112.
Clothes Moth, 606. Clotho, 980. Clotilda, 608. Cloud, 606; fog, 1024; hail, 1232; rain, 2368; rainbow, 2369; snow, 2665. Cloudberry, 607. Cloud-Burst, 607. Clover, or Trefoil, 607, 1026, 1269. Cloves, 608, 2025, 2707. Cloves (garlic), 1098, 2037. Clovis, 608, 1049, 2247. Club, 608. Cluny, or Clugny, France, 608; Cluniac Monks, 608. Clyde River, 608, 2562. Clymer, George, 2989, 2995. Clytemnestra, 608, 34, 2052. Cnut, or Canut, 467, 783. Coach, 609; carriage, 490. Coach, 609; carriage, 490.
Coagulation, 315.
Coal, 609; anthracite, 111; bituminous, 609; cannel, 462; lignite, 1590; mining, 1795.
Coal Fields, 609; coal measures, 609.
Coal Gas, 1002, 1101, 1874.
Coal Oil. See Petroleum, 2176.
Coal Tar, or Gas Tar, 610, 2817. Coanta River, 103. Coastal Plains, 610. Coasting, 610, 2888. Coast Range, 610, 438, 2049. Coast Survey, 611, 2782. Coatesville, Pa., 611. Coati, or Coati-Mondi, 611. Coat of arms, 1290. Cobalt, 611, 547, 849, 1972. Cobalt, Ont., 611, 1972. Cobb, Cyrus and Darius, 611. Cobb, Henry Ives, 612. Cobden, Richard, 612, 680, 2747. Cobham, Lord, 159, 2371. Cobi, or Gobi, 1156, 2369. Coblenz, or Koblenz, Rhenish Prussia, 612. Cobourg, Ontario, 612. Cobra de Capello, 612. See SNAKES, 2663. Coburg, Germany, 613.
Coca, 613; cocaine, 613.
Cocaine, 613, 94.
Cocculus Indicus, 613.
Coccus, 613; cochineal, 614.
Coccyx, 2646, 2709.

Cochabamba, Bolivia, 613.
Cochin, British India, 613.
Cochin China, 613, 1047.
Cochineal, 614, 849.
Cochrane, Thomas, 614.
Cockatoo, 614, 2114.
Cockburn, Sir Alexander, 615, 48.
Cockchafer, 615; beetle, 263.
Cockle, 615, 303, 1821.
Cocklebur, 615, 3115.
Cock of the Rock, 615.
Cock of the Wood, 471.
Cockran, William Bourke, 615.
Cockroach, 615, 257, 859. Cochabamba, Bolivia, 613. Cockron, William Bourke, 615.
Cockroach, 615, 257, 859.
Cockscomb, 79.
Cocoa, or Cacao, 615, 2088.
Cocoanut, 616, 2088.
Cocoon, 616, 2636, 2948.
C. O. D., 4, 960.
Cod, 616, 1006; boiled codfish, 2009.
Cod, Cape and Bay, 616, 468.
Coddington, William, 617.
Code Napoléon, 617.
Codex, 617, 1701.
Codicil (will), 3149.
Cod-Liver Oil, 617, 913, 1597, 2025.
Codrus, 617, 27.
Cody, William Frederick, 617, 586.
Coeducation, 618; education, 872.
Coelenterata, 618.
Coelestius, or Celestius, 2142. Coelestius, or Celestius, 2142. Coeur d' Alene, 619, 1360, 1362. Coffee, 619, 363, 430. Coffee Republic. See Costa Rica, 685. Coffeyville, Kan., 619, 1419. Coffin, 619, 2529. Coffin, Charles Coffin, 620. Coffin, Charles Coffin, 620.
Cognac, 360, 620.
Cognac, France, 620.
Coherer, 1616, 2837.
Cohesion, 620, 22, 518.
Cohoes, N. Y., 620, 1958.
Coinage, 620, 169, 1825, 2006.
Coir, 620, 2449.
Coke, 620, 1101.
Coke, Sir Edward, 621.
Coke, Thomas, 621.
Colbert, Jean Baptiste, 621, 457, 1632.
Colburn, Warren, 621.
Colburn, Warren, 621.
Colchicum, 621.
Colchicum, 621. Colchicum, 621. Colchis, 1160, 1443. Coldewey, Captain, 2249. Cold Harbor, Va., 622, 557. Cold Storage, 622; ice, 1357. Coldwater, Mich., 622. Cole, Thomas, 622. Cole, Thomas, 622.
Coleridge, John Duke, 622, 2439.
Coleridge, Samuel Taylor, 622, 920, 2692.
Coleridge, Taylor Samuel, 623.
Coles, Abraham, 3254.
Colfax, Schuyler, 623, 2976.
Colgate University, 623, 1958.
Coligny, Gaspard de, 623, 238, 1216, 1288.
Coligny, Mexico, 623.
Collect on Delivery, 960.
College, 623, 772, 873, 1028.
College Point, N. Y., 624.
Colleges of Agriculture, 38, 873.
Collie, or Sheep Dog, 624; Scotch collie, 2611.

Collier, Elisha H., 2404. Collier, John Payne, 624. Collingwood, Ontario, 625. Collins, William, 625. Collins, William Wilkie, 625. Collodion, 625, 2201. Collyer, Robert, 625. Collyer, Robert, 625.
Colman, Norman Jay, 625, 2993.
Colmar, or Kolmar, Germany, 625.
Cologne, Germany, 626, 1128.
Cologne, Cathedral of, 133, 626.
Colombia, South America, 626, 3028.
Colombo, Ceylon, 627, 525.
Colon, in anatomy, 120.
Colón, or Aspinwall, Panama, 628, 2092.
Colonel, 477, 2394; lieutenant, 1682.
Colonial Congress, 653, 769.
Colonna, Cape, 628. Colonial Congress, 653, 769.
Colonna, Cape, 628.
Colonna, Victoria, 628.
Colony, 628; France, 1047; Germany, 1127; Great Britain, 1189; Phoenicia, 2197; Portugal, 2287; Spain, 2696; United States, 2984.
Colophon, Asia Minor, 629.
Color, 629; color blindness, 633; rainbow, 2369; spectrum, 2703.
Colorado, 630, 784, 1020, 2978.
Colorado, University of, 632, 631.
Colorado Beetle, 632, 263, 1393.
Colorado River, 632.
Colorado River, 632.
Colorado Springs, Colo., 632.
Color Blindness, 633, 963.
Color Printing, 633. Color Blindness, 633, 903.
Color Printing, 633.
Colosseum, 633, 92, 2440.
Colossians, Epistle to the, 289.
Colossus, 633, 2409.
Colt, Samuel, 633, 2404.
Colton, Charles C., 3254. Coltsfoot, 634. Columba, Saint, 634, 1400. Columbia, District of, 634, 3090. Columbia, District of, 634, 3090.
Columbia, Mo., 634.
Columbia, Pa., 634.
Columbia, S. C., 634, 2688.
Columbia, Tenn., 634, 2844.
Columbian University, 634, 2997.
Columbia River, 634, 743, 2049, 2506.
Columbia University, 635, 2997.
Columbia University, 635, 2997. Columbia University, 635, 2997.
Columbium, 547.
Columbus, Ga., 635, 1121.
Columbus, Ind., 635.
Columbus, Miss., 635, 1809.
Columbus, Ohio, 635, 2975.
Columbus, Bartholomew, 635.
Columbus, Christopher, 635, 211, 987, 2978.
Columbus, Diego, 721.
Columbus, Diego, 721.
Columbus, G36; architecture, 132.
Colvin, Sidney, 637.
Colza Oil, 2025, 2375.
Coma, 637, 766; trance coma, 2909.
Comanches, 637.
Combes, Justin Louis Emile, 637. Comb, 637; hair dressing, 1233. Combes, Justin Louis Emile, 637. Combustion, 638, 2713. Comedy, 638, 140, 825, 2041. Comenius, John Amos, 638, 874. Comet, 638, 816, 2671. Comines, Philippe de, 1048. Commander, 477, 2394. Commander Islands, 279. Commandments, 767, 1858.

Commencement, 640. Commerce, 640; exchange, 957. Commerce, Chamber of, 641. Commerce and Labor, Departments of, 641, 425. Commercial Law, or Mercantile Law, 641. Commissary, 641. Commissary, 641; brokerage, 380. Committee, 641, 1069. Commodore, 641, 2394. Commodus, 2444. Commodus, 2444.
Common Law, 642, 1551.
Commons, 642, 2111.
Common Schools, 642, 873, 2554.
Commonwealth, 642, 921, 3020.
Commune, 642, 266.
Commune of Paris, 642, 2107.
Communism, 642, 79.
Commune 643, 475, 2104 Communism, 642, 79.
Commute, 643, 475, 2104.
Como, Italy, 643.
Como, Lake, 643.
Comoro Islands, or Comores, 643, 1864.
Company, 643, 1467, 2116.
Company (military), 247, 643.
Comparison, 643, 2195.
Compass, 643, 2616.
Compass Plant, 644.
Compositae, 644: arnica, 152; golden ro Compositae, 644; arnica, 152; golden rod, 1161; thistle, 2864.
Composition Style, 133, 637.
Compressed Air, 644, 43.
Compressibility, 886.
Compromise, 644, 707.
Compromise of 1833, 644.
Compromise of 1850, 644, 597.
Compulsory Education, 875.
Compulsory Education, 875.
Comstock Lode, 645, 331.
Comte, Auguste Marie, 645, 78, 1048, 2669.
Comyn, John, 386.
Concentration, 645, 1290.
Conception, 645, 2156, 2328.
Conception, 645, 2156, 2328.
Concertina, 645, 12.
Conch, 645, 2922.
Conchology, 646, 3225. thistle, 2864. Conch, 645, 2922.
Conchology, 646, 3225.
Conclave, 646; cardinal, 481.
Concord, Mass., 464.
Concord, N. C., 646.
Concordant, 646; 1942.
Concordant, 646; treaty, 2914.
Concrete (in arithmetic), 646.
Concrete (stone), 647, 2128.
Condé (Louis II.), 647, 1334, 1632, 2937, 3049.
Condensed Milk, 647, 1787.
Condiment, 647, 2210.
Condittiere, 2600. Condittiere, 2600. Condor, 648, 3066. Conduction, 1275. Cone, 648, 2217. Cone, 648, 2211.
Conemaugh Flood, 648, 1466.
Coney Island, 648, 1436, 1625.
Confectionery, 461.
Confederacy of Delos, 777.
Confederate States, 649, 760, 2739, 2981. Confederate Veterans, United, 650. Confederate Veterans, United Sons of, 650. Confederation, Articles of, 158, 2980. Confucius, 651, 568; Confucians, 2394. Conger, Edwin Hurd, 651, 2141. Congo, or Kongo, Free State, 652, 2725. Congo, or Kongo, River, 651, 1611, 2425.

Congregationalists, 652, 1373. Congress, 652, 2984; veto, 3040. Congressional Library, 1584, 3092. Congressional Record, 653. Congreve, William, 653, 3245, 3252. Coniferae, 654, 2217. Coniferae, 654, 2217.
Conjugation (grammar), 1129, 1387, 2195.
Conjunction (astronomy), 654, 174.
Conjunction (grammar), 2117.
Conkling, Roscoe, 654, 2236.
Connaught, Ireland, 1407.
Conneaut, Ohio, 655.
Connecticut, 655, 2978.
Connecticut River, 657, 655.
Connective Tissue, 657, 517, 2207.
Connellsville, Pa., 657.
Connersville, Ind., 657.
Conne, 657. Conon, 657. Conscience, 557, 872. Consciousness, 658, 523, 2328. Conservation (forestry), 1033, 2968. Conservatives, 658, 1581. Conservatory, 658. Conservatory, 658.
Conshohocken, Pa., 658.
Consonant, 658, 76, 2198.
Conspiracy, 658.
Constable, Archibald, 658.
Constable, John, 658.
Constabulary of Ireland, 2253.
Constance, Lake, 658, 2406.
Constant, Jean Joseph Benjamin, 659.
Constantine Algeria 68 Constant, Jean Joseph Benjamin, 659. Constantine, Algeria, 68. Constantine I., Flavius, 659, 660, 2444. Constantine, 659; of Greece, 62, 1116, 1196. Constantinople, Turkey, 660, 422, 717, 2943. Constilutions, 660, 253, 2253, 3223. Constitution, 661, 158, 2984. Constitution, battle ship, 661, 1335. Constitutional Law, 1551. Constitutional Union Party, 662, 269, 2260. Constitution of the United States, 2984. Consul, 662, 1797. Consumption, 662; tuberculosis, 2930. Consul, 662, 1797.
Consumption, 662; tuberculosis, 2930.
Consumption (economics), 662, 2255.
Contempt, 663, 2005.
Continental Congress, 1288, 1446, 218
Contraband, 663.
Contract, 663, 35, 664.
Contraction. See Abbreviation, 3.
Contreras, 579, 2506.
Convict Labor, 664, 2316.
Conway, Moncure Daniel, 664.
Conwell, Russell Herman, 664.
Conv (pika), 2213. 1288, 1446, 2184. Conwell, Russell Herman, 664.
Cony (pika), 2213.
Cook, Frederick Albert, 664, 2251.
Cook, James, 664, 191, 347, 1072, 1558, 1943.
Cook, Joseph, 664, 3251.
Cooke, Henry D., 804.
Cooke, Jay, 665.
Cooke, John Esten, 665.
Cookery, 665; food, 1027.
Cook Inlet, 665, 50.
Cook Islands, 665.
Cook Strait, 666. Cook Strait, 666. Cook Strait, 666.
Cooley, Thomas McIntyre, 666.
Coombs, Leslie, 666.
Cooper, Sir Astley Paston, 666.
Cooper, Edward, 668.
Cooper, James Fenimore, 666, 86, 410.
Cooper, Peter, 666, 667, 1198, 1239.
Cooper, Robin, 485.

Cooperage, 667; barrel, 237.
Coöperation, 667; labor, 1525.
Cooper's Creek, 667.
Cooper Union, 667, 1961.
Coornhert, Direk Volckertsen, 1927.
Coos Bay, 668, 468.
Coot, 668, 2365.
Cootenai. See Kootenais, 1518.
Conaiba. or Copaiya, 668. Copaiba, or Copaiva, 668. Cope, Edward Drinker, 668. Cope, Edward Drinker, 668.
Copenhagen, Denmark, 668, 782.
Copernican System, 173.
Copernicus, Nicholas, 669, 173, 1087.
Copiapó, Chile, 669.
Copley, John Singleton, 669.
Copper, 669, 381, 547.
Copperfield, David, 446, 796.
Copperas, 670.
Copperhead (spake), 670. Copperas, 670.
Copperhead (snake), 670.
Copperhead, 670.
Coppermine River, 670, 681.
Copper River, 50.
Copra, 670, 616.
Coptic Version, 288.
Copts, 670, 883; religion, 2394.
Copying Machine, 670.
Copyright, 671, 2992.
Coquelin, Benoît Constant, 671.
Coquimbo, Chile, 672.
Coral, 672, 236, 282.
Coral Sea, 672.
Corbett, Boston, 338. Coral Sea, 672.
Corbett, Boston, 338.
Corbin, Henry Clark, 673.
Corcoran, William Wilson, 673, 3092.
Corcoran Art Gallery, 673, 3092.
Corcyra, 1910.
Cordage, 75, 2448.
Corday D'Armot, Marie Anne, 673, 1703.
Cordelier Club, 751.
Cordillera, 673 Cordillera, 673.
Cordilleras, 673, 1987, 2433.
Cordova, or Córdoba, Argentina, 673.
Cordova, or Córdoba, Spain, 673. Cordovan Leather, 1556. Corduroy, 673.
Corduroy Road, 673; road, 2426.
Corea, or Korea, 674, 1441.
Corelli, Marie, 675. Corelli, Marie, 675.
Corentyn River, 675.
Corentyn River, 675.
Corey, or Cory, Giles, 2900, 3171.
Corfu Island, 675, 1400.
Coriander, 676, 2958.
Corinth, Greece, 676, 1195.
Corinth, Gulf of, 676.
Corinth, Miss., 676, 2451.
Corinth, Isthmus of, 676.
Corinthians, Epistles to the, 676, 2126.
Corinthians, Epistles to the, 676, 2126.
Corinthian Style, 133, 637.
Coriolanus, Caius Marcius, 676.
Cork, 677, 2012.
Cork, Ireland, 677, 1406.
Corliss, George Henry, 677.
Cormorant, 677, 2601.
Corn, Indian. 678, 1382, 2009, 2726.
Cornerake, 678; rail, 2365.
Cornelle, Pierre, 678, 1048.
Cornel, 679.
Corneline, Pater and 670. Cornelia, 679, 1174. Cornelius, Peter von, 679. Cornell, Alonzo B., 679. Cornell, Ezra, 679.

Cornell University, 679, 2997. Corner State, 3093. Cornet, 680. Corn Harvester, 680, 1261. Corn Harvester, 680, 1261.
Cornice, 222.
Corning, N. Y., 680, 1958.
Corn Laws, 680, 612.
Cornplanter, 680, 1413.
Cornstarch, 678, 2727.
Cornwall, Barry, 2318.
Cornwall, Ontario, 680.
Cornwall and York, Duke of, 2312.
Cornwallis, Charles, 680, 2980, 3209.
Corolla, 681, 741, 1020.
Coromandel Coast, 1493, 1671.
Corona, 681, 2776.
Coronado Beach, 2516. Corona, 681, 2776.
Coronado Beach, 2516.
Coronation, 681; crown, 714.
Coronation Chair, 681, 3127.
Coronation Gulf, 681, 670.
Coronation of the Virgin, 101.
Coroner's Jury, 1480.
Corot, Jean Baptiste Camille, 681.
Corpus Christi, 682.
Corpus Christi, Tex., 682, 2853.
Corpuscles. 314. Corpuscular Theory, 1955. Correggio, Antonio Allegri, 682, 2081. Correlation, 682.
Corrientes, Argentina, 138.
Corrigan, Michael Augustine, 682.
Corrosive Sublimate, 682; embalming, 909. Corry, Pa., 682. Corsair, 682; piracy, 2221. Corset, 830. Corset, 830.
Corsica, or Corse, Island, 682, 1049, 1894.
Corsicana, Texas, 683, 2853.
Cort, Henry, 683, 1411.
Cortelyou, George Bruce, 683, 641.
Cortereal, Gaspar, 1526.
Cortes, 683, 2695.
Cortex, or Bark, 231.
Cortez, Fernando, 683, 79, 201, 3036.
Cortland, N. Y., 684.
Corundum, 684, 1794, 2527.
Corunna, 1843.
Corwin, Thomas, 684.
Coshocton, Ohio, 684. Corwin, Thomas, 684.
Coshocton, Ohio, 684.
Cosimo, Pietro di, 2532.
Cosmogony, 684; creation, 855.
Cossacks, 685, 1896, 2472.
Cossutia, 429.
Costa, Sir Michael, 685.
Costa Rica, 685, 521.
Coster, Lourens, 686, 1227, 2313.
Cotes, Sara Jeanette Duncan, 686.
Cotillion, 748, 3079.
Cotopaxi, 686, 867.
Cotta, Bernard, 1978.
Cotton, 686, 437, 1882; insect, 1 Cotton, 686, 437, 1882; insect, 1393; weevil, 3116. Cotton, John, 688. Cotton, Sir Robert Bruce, 688. Cotton Famine, 688. Cotton Gin, 688, 3143. Cotton Seed, 688, 2025. Cotton Spinning Frame, 145. Cotton Stainer, or Red Bug, 688. Cotton State, 45. Couch, Darius Nash, 688.

Coues, Elliott, 688. Cougar, 688, 2334. Cough, 688, 662. Coulter, John Merle, 689. Council, Privy, 2316. Council Bluffs, Iowa, 689, 1403. Counterfeiting, 689. Countersign, 689. County, 689; state, 2729. Coupé, 689. Courland, Russia, 219, 1575.
Court, Antoine, 689.
Court Fool, 689.
Courthope, William John, 690.
Court of the Lions, 69.
Court-Martial, 690.
Courts, 690, 23, 1173, 2975, 2976.
Cousin, Samuel, 690.
Cousin, Victor, 690, 1048.
Couture, Thomas, 690.
Covenant, 691, 1981 Courland, Russia, 219, 1575. Covenant, 691, 1981. Covenanters, 691, 1435. Covenanters, 691, 1435.
Covent Garden, 691, 1622.
Coventry, England, 691.
Coventry, R. I., 691.
Coverdale, Miles, 691, 288.
Covington, Ky., 692, 1502.
Cow, 692, 511, 1787.
Cowbird, or Cow Bunting, 692.
Cowdery, Oliver, 1849.
Cowhage, or Cowitch, 692. Cowdery, Oliver, 1849.
Cowhage, or Cowitch, 692.
Cowley, Abraham, 692, 919.
Cow Parsnip, 692; parsnip, 2115.
Cowpens, S. C., 692.
Cowper, William, 693, 920.
Cowpox, 693, 3009.
Cowry, or Cowre, 693; mollusca, 1821.
Cowslip, 693, 1021, 2310.
Cow Tree, 693.
Cox, Jacob Dolson, 693.
Cox, Jacob Dolson, 693.
Cox, Kenyon, 694.
Cox, Palmer, 694.
Cox, Samuel Sullivan, 694.
Coxe, Arthur Cleveland, 694.
Coxey, Jacob Sechler, 694.
Coyote, 694, 3174.
Coyote State, 1992.
Crab, 694, 698; crustacea, 717.
Crab Apple, 121.
Crabbe, George, 694, 920.
Crabtree, Charlotte, 695.
Cracow, or Kraków, Austria-Hungary Cowhage, or Cowitch, 692. Crackers, 300.
Cracow, or Kraków, Austria-Hungary, 695.
Craddock, Charles Egbert, 1874.
Craig, William Bayard, 825.
Craigie, Pearl Richards, 695.
Craik, Dinah Maria Mulock, 696, 1717.
Craik, Robert, 696.
Crake, 2365; corncrake, 678.
Cranberry, 696.
Crane, 696; whooping crane, 696.
Crane, Stephen, 696.
Crane, Walter, 697.
Crane, Winthrop Murray, 697.
Crane's Bill, 1122.
Crangles, 3253.
Cranial Nerves. See Nerves, 1922.
Craniology, 2204. Craniology, 2204. Craniometer Craniometry, 112. Cranium, 697, 2648.

Cranmer, Thomas, 697, 1547. Crannogs, 697. Crannon, Battle of, 781. Crannon, Battle of, 781.
Cranston, R. I., 697, 2409.
Crape, or Crêpe, 697.
Crassus, Marcus Licinius, 697, 429, 2268.
Crater, 698, 3060.
Crawfish, or Crayfish, 698, 718, 2622.
Crawford, Alice A., 3235.
Crawford, Francis Marion, 698.
Crawford, Isabella Valancy, 456.
Crawford, Thomas, 698, 2570.
Crawford, William Harris, 698, 1429.
Crawfordsville, Ind., 699. Crawford, William Harris, 698, 1429.
Crawfordsville, Ind., 699.
Crayon, 699; pencil, 2145.
Crayon, Geoffrey, 2327.
Cream, 699, 1787.
Creamery, 699; butter, 418.
Cream of Tartar, 699.
Creasy, Edward Shepherd, 699, 248, 1803.
Creation, 684, 855, 1156.
Crécy, France, 699.
Credit, 699, 1826.
Crédit Mobilier, 700.
Crédit Mobilier, 700.
Crédit Mobilier, Scandal, 700, 1097.
Cree Indians, 700, 2534.
Creed, 700, 157.
Creek Indians, 701, 472, 2028.
Creek War, 701, 3085.
Creeper, 701.
Cremation, 702; burial, 408. Cremation, 702; burial, 408. Cremona, Italy, 702. Cremona, Italy, 702. Cremonas, 80. Creole, 702, 868, 2599. Creole State, 1634. Creosote, 702, 2392. Crerar, John, Library, 554. Crescent, 702, 716, 2581. Cress, 702; Virginia cress, 702. Creswick, Thomas, 702. Cretaceous Period, 703, 1115. Creswick, Thomas, 702.
Cretaceous Period, 703, 1115.
Crete, or Candia, Island, 703, 1195.
Cribbage, 703, 482.
Crichton, James, 704.
Cricket, 704, 1615.
Cricket (athletic), 704, 216.
Crimea, 705, 213.
Crimean War, 706, 593, 1510, 1651, 1897, 1971, 1974, 2364, 2944.
Crinoidea, 706.
Crinoline, 706; dress, 829.
Cripple Creek, Colo., 706, 632.
Crisp, Charles Frederick, 706.
Crispi, Francesco, 706.
Critic, 706.
Critic, 706.
Crittenden, George Bibb, 707. Criticism, Higher, 706.
Crittenden, George Bibb, 707.
Crittenden, John Jordan, 707, 1790.
Crittenden, Thomas Leonidas, 707.
Crittenden Compromise, 707.
Croatia and Slavonia, 707, 195.
Crockett, David, 708.
Crockett, Samuel Rutherford, 708.
Crocodile, 708, 72, 1105.
Crocodile, or Oori Limpopo, River, 2040, 2911.
Crocus, 709, 2484.
Croesus, 709, 287, 2674.
Croker, John Wilson, 709.
Croker, Richard, 709, 2813.
Croly, Jane Cunningham. 709

Crome, John, 710.
Cromer, Evelyn Baring, 710.
Crompton, Samuel, 710, 687.
Cromwell, Oliver, 710, 922, 1407, 1567, 1717
1791, 2321, 2565, 3020, 3151.
Cromwell, Richard, 921, 922, 2321.
Cromwell, Thomas, 711, 1287.
Cronje, Piet, 711, 2491, 2680.
Cronstadt. See Kronstadt, 1522.
Cronus, or Kronus, 2405, 2535, 2883.
Crook, George, 711, 1134.
Crookes, William, 711, 546, 2363.
Crookes Tubes, 711.
Croosey, Jasper Francis, 712.
Croquet, 712, 1093.
Crore, 1527, 2463.
Crosby, Frances Jane, 712, 1353.
Crosby, Frances Jane, 712, 1353.
Crosby, Pierce, 712.
Cross, 713, 716, 1686, 2385.
Cross, Ada Cambridge, 713.
Cross, Mary Ann. See Eliot, 902.
Cross, Mary Ann. See Eliot, 902.
Cross, Southern, 713.
Crossbill, 713; finch, 999.
Cross Fertilization, 713; breeding, 367.
Croton, 713.
Crotona, or Croton, Italy, 714.
Croton Aqueduct, 124, 1963. Crome, John, 710. Croton, 713.
Crotona, or Croton, Italy, 714.
Croton Aqueduct, 124, 1963.
Croton Bug, 615.
Croup, 714, 2906.
Crow, 714, 2378, 2446.
Crowfoot, 224, 2374.
Crow Indians, 714.
Crown, 714; coronation, 681.
Crown (money), 714, 1826.
Crown Lands, 715.
Crown Point, N. Y., 715, 71.
Crows, 742.
Crowther, Samuel Adjai, 715. Crown Lands, 715.
Crown Point, N. Y., 715, 71.
Crows, 742.
Crowther, Samuel Adjai, 715.
Croydon, England, 715.
Crozier, William, 715.
Crucible, 715, 2737.
Cruelty to Animals, 715, 279.
Cruelty to Children, 558.
Cruikshank, George, 716, 482.
Crusade of Children, 717.
Crusaders, 716, 1452.
Crusades, 716, 1131, 1157, 2174, 2413, 2813.
Crusoe, Robinson, 772, 1474.
Crustacea, 717, 694, 698.
Crustaceology, 3225.
Cryolite, 718, 2670.
Crypt, 718, 503.
Cry of Tin, The, 2881.
Cryptogamous Plants, 718, 1859, 2579.
Cryptography, 718.
Crystalline Lens, 124, 962.
Crystalline Lens, 124, 962.
Crystallography, 718, 1163, 1794.
Crystal Palace, 2129.
Ctesias, 2529, 2960, 3225.
Cuba, 719, 1627, 2982, 3130.
Cubbeer Burr, 228.
Cube, 722: measure, 1744.
Cubebs, 722.
Cuckoo, 722. 298.
Cucumber, 723, 1172, 2009.
Cucumber Tree, 723.
Cud, 2462, 2960.
Cuenca, Ecuador, 723, 868.
Cufic Writing, 723.

Cuirassier, 723.
Culberson, Charles A., 723.
Cullen, Maurice Galbraith, 723.
Cullen, Moor, 723.
Cullom, Shelby Moore, 724.
Cullum, George Washington, 724.
Culture Epoch Theory, 2138.
Cumae, Italy, 724, 448.
Cumana, Venezuela, 724, 3028.
Cumberland, Md., 724, 1723.
Cumberland Mountains, 724, 2842.
Cumberland River, 724, 1500.
Cumberland Road, 724; road, 2426.
Cumberland Road, 724; road, 2426.
Cummins, Albert Baird, 725.
Cumulus Clouds, 607.
Cunard, Sir Samuel, 725, 2732.
Cunaxa, 737.
Cuneiform, 725, 2379. Cunard, Sir Samuel, 725, 2732.
Cunaxa, 737.
Cuneiform, 725, 2379.
Cupel, 169; cupelation, 169.
Cupid, 725, 2327, 3030.
Cupola. See Dome, 814.
Curaçoa, 726, 2045.
Curaçoa, Island, 725.
Curare, 726; nux vomica, 2009.
Curassow. 726, 1210.
Curculio, 3116.
Curfew, 726, 268.
Curie, Pierre, 726, 2363.
Curlew, 726; snipe, 2664.
Curling, 727.
Currant, John Philpot, 727.
Currant, 727, 2009, 3162.
Currency Reform, 727, 294.
Current (electric), 891, 1091.
Currents (oceanic), 728, 1217, 2572.
Currie, Dr. James, 413.
Curry, Jabez Lamar Monroe, 728.
Cursores, 298, 2062.
Curtin, Andrew Gregg, 728.
Curtis, Benjamin Robbins, 729.
Curtis, George Ticknor, 729.
Curtis, George Ticknor, 729.
Curtis, William Eleroy, 729, 2359.
Curtis, Ernst, 729.
Curtius, Ernst, 729.
Curtue, 729, 505. Curtis, William Eleroy, 129, 2559.
Curtius, Ernst, 729.
Curve, 729, 505.
Curzon, George Nathaniel, 730, 1377.
Cuscus, 730. Cuscus, 730.
Cush, or Kush, 730, 940.
Cushing, Caleb, 730.
Cushing, Thomas, 730.
Cushing, William Barker, 730.
Cushman, Charlotte Saunders, 730, 2380.
Cushman, Pauline, 731.
Cushman, Robert, 2214.
Custer, George Armstrong, 731, 122, 2642.
Custis, George Washington Parke, 731.
Custis, John Parke, 731, 3096.
Custis, Martha, 3096, 3097.
Customs Duties, 731, 2819.
Cutch, Gulf of, 126, 162, 1374.
Cuthbert, Saint, 732.
Cuticle, 927, 2647.
Cutis, or Derma, 2647. Cuticle, 927, 2647.
Cutis, or Derma, 2647.
Cutler, Manasseh, 732, 749.
Cutlery, 732; steel, 2736.
Cutter, 732, 320.
Cuttlefish, 732, 1822, 1907, 2018.
Cuvier, Georges, Baron, 733, 1048, 3225.
Cuyler, Theodore Ledyard, 733.
Cuyp, Albert, 733.
Cuyp, Benjamin, 733.

Cuyp, Jacob, 733.
Cuzco, Peru, 733, 136, 2229.
Cyameter, 738.
Cyaxares, 1978, 2571.
Cybele, or Rhea (goddess), 733, 2405.
Cyclades Islands, 733, 1191.
Cyclamin, 734.
Cycle, 734, 1770.
Cycling, 734, 290.
Cyclometer, 734.
Cyclopean, 734.
Cyclopean, 734.
Cyclopean, 734.
Cyclopean, 735.
Cylinder, 735.
Cylinder Press, 2314.
Cymbals, 735.
Cymri, or Kymry, 735, 3072.
Cynics, 735, 3218.
Cynosarges, 801.
Cynthiana, Ky., 736.
Cypress, 735, 518, 660, 1021.
Cyprianus, Thascius Caecilius, 736, 769.
Cyprus, Island, 736, 1750.
Cyrene, Africa, 737.
Cyril, Saint, 737.
Cyril, Saint, 737.
Cyril, Saint, 737.
Cyrus, The Great, 737, 205, 709, 1456, 2164.
Cyrus, The Younger, 737, 93, 753.
Czar, 737, 2471.
Czechs, 737, 324, 2651.
Czernowitz, Austria, 738, 194.
Czerny, George, 738, 2593.
Czerny, Karl, 738.
Czolgosz, Leon, 738, 1666.

D

D, 739, 1879, 2951.
Dab, 739; flatfish, 1011.
Dacca, Bengal, 739.
Dace, or Dare, 739; chub, 578.
Dacians, 2908.
Dacians, 2908.
Dactyl, 1028.
Daedalus, 739, 1803.
Daffodil, 740, 1021, 1897.
Da Gama, Vasco, 1092, 1461.
Dagger, 251, 2449, 2796.
Dagmar, or Aix, 574, 1971.
Dagobert II., of Austrasia, 740, 1762.
Dagobert III., of Austrasia, 740.
Dagon, 740, 2513.
Daguerre, Louis Jacques Mandé, 740, 2201.
Daguerrotype, 740.
Dahlgren, John Adolph, 740.
Dahlgren, Madeline Vinton, 740.
Dahlgren Gun, 740.
Dahlia, 741.
Dahn, Julius Sophus Felix, 741.
Dahn, Julius Sophus Felix, 741.
Dahomey, 741, 33, 1047.
Dairying, 741, 418.
Daisy, 742, 1021; ox-eye daisy, 577.
Dakota, North, 1992.
Dakota, South, 2689.
Dakota Indians, 742, 2421, 2642.
Dakota River. See James River, 1434.
D'Albert, Jean, King of Navarre, 841.

Dale, Sir Thomas, 743. D'Alembert, Jean, 743, 1048. Dalhousie, James Andrew Broun Ramsey, Dalhousie University, 1237. Dall, Caroline Wells, 618.
Dallas, Tex., 743, 2853.
Dallas, Alexander James, 743.
Dallas, George Mifflin, 743, 2976.
Dalles, 743.
Dalles, The, or Dalles City, Or., 744. Dalmes, The, of Darles Chy Dalmatia, 744, 195. Dalrymple, Sir John, 1151. Dalton, John, 744, 180, 546. Daltonism, 633. Daltonism, 633.
Daly, John Augustin, 744, 758.
Dalzell, John, 744.
Dam, 744; beaver, 255.
Damages, 745, 1164, 2899.
Damaraland, 745.
Damascus, Syria, 745, 2802.
Damascus Steel, 746.
Damiett, Joseph de Veuster, 746.
Damietta, Egypt, 746, 883.
Damocles, 746.
Damon and Pythias, 746, 1515.
Damps, 747, 572, 1002.
Damrosch, Leopold, 747, 2041.
Damrosch, Walter Johannes, 747.
Damson, 747, 2240.
Dan, 747, 1455.
Dana, Charles Anderson, 747, 381, Dan, 747, 1455.
Dana, Charles Anderson, 747, 381, 3157.
Dana, James Dwight, 747, 1795.
Dana, Richard Henry, 747.
Dana, Richard Henry, 748.
Danaides, 748.
Danbury, Conn., 748, 656.
Dancing, 748, 216, 975, 2243, 3079.
Dandelion, 748, 1021, 3115.
Dandolo, 749.
Dane, Nathan, 749. Dandelion, 748, 1021, 3115.
Dandolo, 749.
Dane, Nathan, 749.
Danes, 782, 921, 2788.
Daniel, 749, 289, 2320.
Daniel, John Warwick, 750.
Daniel, Samuel, 1548, 3251.
Daniell, John Frederick, 750.
Danish Literature, 783.
Danish Literature, 783.
Danish West Indies, 750, 782.
Dannat, William T., 750.
Dante, Alighieri, 750, 1015, 1422.
Danton, George Jacques, 751, 2429.
Dantzic, or Danzig, Germany, 751.
Danube River, 751, 193, 1338.
Danvers, Mass., 752.
Danville, Ill., 752, 1367.
Danville, Va., 752.
Dantanelles, 753, 1712, 3195. Dardanelles, 753, 1712, 3195. Dardanus, 2238. Dare, Virginia, 753. Dar-es-Salaam, 1123. Dar-es-Salaam, 1123.
Darfur, 753, 2767.
Darien, Gulf of, 753.
Darien, Isthmus of, 753, 214.
Darien Scheme, 753, 2122.
Darius I., of Persia, 753, 3195.
Darius II., 753, 155.
Darius III., 753, 62, 1195.

Dark Ages, 754, 35.
Darley, Felix Octavius Carr, 754.
Darling, Grace Horsley, 754, 978.
Darling, William, 754.
Darling Range, 754, 3124.
Darling River, 754, 188, 1952.
Darmstadt, Germany, 754, 1296.
Darning Needle, 1917.
Darnley, Henry Stuart, 754, 1723, 2565.
Darrah, Mrs. Lydia, 754.
Darter, 755.
Darter, or Snakebird, 755.
Dartmoor, England, 755. Darter, or Snakebird, 755.
Dartmoor, England, 755.
Dartmouth College, 755, 1249, 1942.
Dartmouth College vs. Woodward, 755, 3114.
Darwin, Charles Robert, 756, 920, 956, 3225.
Darwinism, 756; evolution, 955.
Dasyure, 756; marsupialia, 1717.
Date, 757, 113.
Date Plum, 757, 2166.
Daubigny, Charles François, 757.
Daudet, Alphonse, 757, 1048, 2004.
Daughters of American Revolution, 758. Daughters of American Revolution, 758.
Daun, Leopold von, 1309.
Dauphin, 758, 537, 1708.
Davenant, William, 1548.
Davenport, Iowa, 758, 1403.
Davenport, Edward Loomis, 758. Davenport, Iowa, 758, 1403.
Davenport, Edward Loomis, 758.
Davenport, Fanny Lily Gipsy, 758.
David, 758, 1456, 2326.
David, Jacques Louis, 759.
David, Pierre Jean, 759.
David, of Scotland, 2564.
David II., of Scotland, 387, 2564.
Davidson, John, 759.
Davis, Sir Louis Henry, 759.
Davis, Cushman Kellogg, 759.
Davis, David, 759.
Davis, Henry Winter, 760.
Davis, Jacques Louis, 3035.
Davis, Jefferson, 760, 88, 591, 649, 2981.
Davis, John Chandler Bancroft, 760.
Davis, Nathan Smith, 761.
Davis, Rebecca Harding, 761.
Davis, Varina Anna, 761.
Davis Strait, 761, 210.
Davitt, Michael, 761.
Davis, Sir Humphry, 761, 2483, 2670.
Dawes, Rufus, 3254.
Dawson, Yukon, 762, 3213.
Dawson, George Mercer, 762. Dawes, Rufus, 3254.
Dawson, Yukon, 762, 3213.
Dawson, George Mercer, 762.
Dawson, Sir J. William, 762.
Day, 762; antipodes, 113; twilight, 2948; days of the week, 3116.
Day, William Rufus, 763.
Day Lily, 763; lily, 1592.
Dayton, Ky., 763.
Dayton, Ohio, 763, 2024.
Dayton, Jonathan, 2989.
Dayton, William Lewis, 764.
Deaconess, 764. Dayton, William Lewis, 764.
Deaconess, 764.
Dead Letter, 764, 2291.
Dead Letter Office, 764, 2291.
Dead Sea, 764, 2084, 2672.
Deadwood, S. D., 764, 2691.
Deaf-Mutes, 765, 373.
Deák, Franz, 765, 1339.
Deakin, Alfred, 766.
Deane, Silas, 766, 773.

Dearborn, Fort, 766, 555.
Dearborn, Henry, 766, 1117.
Death, 766; punishment after death, 1281.
Deborah, 767, 1456.
Debreczen, Hungary, 767.
Debs, Eugene Victor, 767, 2668.
Debt, 767; credit, 699; usury, 3004.
Decalogue, 767, 1858.
Decameron, 321, 1422.
De Camps, Alexandre Gabriel, 768.
De Candolle, Alphonse Louis Pierre, 768.
Decapoda, 768, 694, 698, 717.
Decapolis, Palestine, 768. Decapoda, 768, 694, 698, 717.
Decapolis, Palestine, 768.
Decatur, Ill., 768, 1367.
Decatur, Stephen, 768.
Deccan, 768, 1374, 2601.
December. See Month, 1839.
Deciduous Plants, 2233.
Deciduous Trees, 955.
Decius, Caius Messius, 769, 2594.
Declaration, 769. Declaration, 769.
Declaration of Independence, 769, 1447, 2993.
Declaration of Rights, 769, 293.
Declaration, 769.
Decomposition, 769.
Decomposition, 769.
Decoration, or Memorial Day, 770, 1177.
De Costa, Benjamin Franklin, 770.
Decoy, 770.
Decham Mass. 770. Decoy, 770.
Dedham, Mass., 770.
Deduction, 1385, 1619.
Deductive Method, 770.
Dee River, 770, 2562.
Dee River (Scotland), 770.
Deed, 771, 3085. Deems, Charles Force, 771. Deer, 771, 2721, 2393. Deer Mouse, or Jumping Mouse, 772, 1449. Deer, 771, 2721, 2393.
Deer Mouse, or Jumping Mouse, 772, 1449.
Defeated Presidents, 396.
Defiance, Ohio, 772.
Defoce, Daniel, 772, 920, 1474.
Degree, 772, 855.
Degree, in mathematics, 772.
Dehorning, 773, 511.
Deism, 773. See God, 1156.
Dekalb, Ill., 773.
De Kalb, John, Baron, 773, 766.
De Koven, Reginald, 773, 2041.
Delacroix, Eugéne, 773.
Delagoa Bay, 773, 29.
Delancey Divinity School, 1109.
Deland, Margaretta Wade Campbell, 773.
Delagoa Hay, 774, 1020, 2978.
Delaware, 774, 1020, 2978.
Delaware, 774, 1020, 2978.
Delaware, 776, 774.
Delaware River, 776, 774.
Delaware River, 776, 774.
Delaware Water Gad, 776, 2969.
Delbrück, Hans, 776.
Delbrück, Martin, 776.
Delcassé, Théophile, 776.
Delft, Holland, 777, 1926.
Delft, Porcelain, 2295.
Delhi, India, 777, 2336.
Delirium Tremens, 777.
De Long, George Washington, 777, 1753. Delirium Tremens, 777.
De Long, George Washington, 777, 1753.
Delos Island, 777, 733. Delphi, Greece, 778, 2341. Delphos, Ohio, 778.

Delsarte, François Alexandre, 778. Delsarte System, 778. Delta, 778, 1094, 1976. Deluge, 779, 1981. De Luxe Editions, 290. Demavend, Mount, 164, 2163. Dementia, 1392. Dementia, 1392.
Demerara, 1214.
Demetrius I., 779.
De Mille, James, 779.
Democracy, 779, 2398.
Democratic Party, 779, 2256, 2399, 2976, 3280.
Democritus, 780, 790.
Demon, 780; devil, 790.
De Monts, Pierre du Gast, 780.
Demosthenes, 780, 2184, 2187, 2771.
Demurrer, 781; process, 2317.
Denarius, 781, 2152.
Denis, Saint, 781, 2853.
Denison, Texas, 781.
Denmark, 781; Danish literature, 783; flag, 1009; colonies, 750, 978, 1199, 1359; invasion of England, 920. of England, 920. Denner, John Christopher, 593. Dennison, William, 784. Density, 784, 855, 1184. Dentine, 2832. Dentist, 784. Dentist, 784.
Denver, Colo., 784, 631, 2975.
Denver, University of, 785, 631.
Deoder Cedar, 515.
De Pauw University, 785.
Depew, Chauncey Mitchell, 785.
De Peyster, John Watts, 785.
De Quincey, Thomas, 785, 920, 2327.
Derby, Conn., 786.
Derby, England, 786, 918.
Derby, Frederick Arthur Stanley. Derby, Frederick Arthur Stanley, 786. De Reszke, Edouard, 786.
De Reszke, Jean, 786.
Dermis. See Skin, 2647.
Derrick, 786.
Derry. See Londonderry, 1624.
Dervish, 786, 11.
Desault, Pierre Joseph, 786.
Descartes, René, 787, 1048, 2196.
Descartes, River, 2033.
Desert, 787, 1156, 2486.
Dessent, 787, 1156, 2486.
Desman, 1882.
Des Moines, Iowa, 787, 94, 2370. De Reszke, Edouard, 786. Des Moines, Iowa, 787, 94, 2370. Des Moines River, 787, 3041. Des Mollies Rivel, 761, 3641.

Desmoulins, Benoit Camille, 788, 2429.

De Soto, Mo., 788.

De Soto, Fernando, 788, 1018, 1808.

Des Plaines River, 788, 459, 805.

Dessau, Germany, 789, 104.

De Staël, Madame de, 2720, 2383.

Detectives, 2253, 2578.

De Tocqueville, Alexis, 789, 1605.

Detroit, Mich., 789, 1780, 2974.

Detroit River, 790, 1778.

Deucalion, 790, 2319, 2342.

Deucher, Adolph, 790.

Deuteronomy, 790, 2154.

Deutsch, Emanuel Oscar Manahem, 790.

Devil, 790, 780; hell, 1281.

Devil, 790, 780; hell, 1281.

Devil's Darning Needle, 823.

Devil's Lake, 791, 1993. Desmoulins, Benoît Camille, 788, 2429.

Dining Car, 2367. Diniz (de Cruz), Antonio, 2287.

Devonian, 791, 35, 1115. Devonshire, Spencer Compton Cavendish, Devonshire, Spencer 791.
Dew, 791, 1074.
Dewberry, 304, 607.
De Wet, Christian, 791.
Dewey, George, 792, 1694, 2982.
Dewey, John, 792.
Dewey, Melvil, 792.
Dewey, Orville, 1606.
De Witt, Cornelius, 792.
De Witt, Jan, 792, 3151.
Dexter Asylum, 2324.
Dextrin, 793; starch, 2726.
Dextrose. See Glucose, 1153. Dextrose. See Glucose, 1153. Dhawalagiri, or Dhaulagiri, Mountain, 793, 1302. Diabase, 793. Diabetes, 1730, 2863, 3002. Diagoras, 793. Dial, 793; sundials, 605. Diameter, 793, 585. Diamond, 793, 478, 1150, 1517, 1794. Diamond State, 774. Diamond State, 774.
Diana, 794, 926.
Diana, Temple of, 794.
Diaphragm, 794, 5, 550.
Diarbekir, or Diarbekr, Turkey, 794.
Dias, or Diaz, Bartolemeu, 794, 471.
Diatoms, 795.
Diatonic Scale, 1880, 2544.
Diaz Ivan, 2103. Diatonic Scale, 1880, 2544.
Diaz, Juan, 2103.
Diaz, Porfirio, 795, 1775.
Diaz, Roderigo, 581, 2696.
Dice, 795; die-cast, 218.
Dickens, Charles, 795, 920, 2004, 2327.
Dickinson, N. D., 796, 1994.
Dickinson, Anna Elizabeth, 796.
Dickinson, Daniel Steven, 796.
Dickinson, Donald McDonald, 796.
Dickinson, John, 796, 2989.
Dickson, Sir James Robert, 796.
Dicotyledonous Plants, 768; dicotyledon, 688.
Dictator, 797, 2443. Dictator, 797, 2443.
Dictionary, 797, 1206, 3114, 3182.
Didactic Poetry, 2245.
Diderot, Denis, 797, 1048, 1063.
Dido, 797, 493. Dido, 797, 493.
Didymium, 798, 547.
Dieffenbach, Johann Friedrich, 798.
Dies Irae, 798.
Dieskau, Ludwig August, 1835.
Diesterweg, Frederich, 798.
Diet (government), 798.
Diet (food), 798, 1027.
Dietrich III., 817.
Diffraction, 798; light, 1587.
Diffusion, 798.
Digger Indians. See Klamaths, 1513.
Dighton Rock, 799.
Digitalis, 2246, 2578.
Dijon, France, 799.
Dike, 799; intrusive sheets, 799.
Dillemma, 799.
Dilke, Sir Charles Wentworth, 799.
Dill, or Dill Seed, 1290, 2958.
Dillon, John, 800.
Dinapur, British India, 800.
Dinapur, British India, 800.
Dinapur, Reson, 800, 193.
Dingley, Nelson, 800, 2820.
Dingo, 800, 190. Didymium, 798, 547.

Dinornis, 800. Dinosauria, 800, 2398. Dinotherium, 800. Dinwiddie, Robert, 801.
Diocletian, Valerius, 801, 4, 2577.
Diogenes, 801, 927.
Diognetus, 101. Diomedes, 801, 1291. Dionysius, The Elder, 801, 1783, 2800. Dionysus, 205, 2584. Dionysus, Theater of, 2855. Diophantus, 141. Diophantus, 141.
Dip (geology), 2757; fault, 981.
Diphtheria, 801, 114.
Diphthong, 802; vowel, 3065.
Diplomacy, 802; treaty, 2914.
Dipper (bird), 802.
Dipper, See Bear, 253, 2253.
Dipping Needle, 802.
Dipsomania, 802, 1829.
Direct Tax, 2984.
Directory, 802, 1894.
Dirigible Balloon, 217, 1024, 3219.
Disciples. See Apostles, 119. Dirigible Balloon, 217, 1024, 3219.
Disciples. See Apostles, 119.
Discount, 802; interest, 1396.
Discoveries, 214, 635, 664, 824, 1072, 1113, 2134.
Disease, 803; ague, 41; anaemia, 93; appendicitis, 120; Bright's disease, 374; cancer, 461; catarrh, 505; cholera, 572; consumption, 662; croup, 714; fever, 993, 1271, 2546, 3203; glanders, 1148; gout, 1172; headache, 1274; hysteria, 1354; insanity, 1392; itch, 1423; jaundice, 1444; leprosy, 1573; malaria, 1683; measles, 1744; neuralgia, 1928; neurosis, 1929; paralysis, 2103; pleurisy, 2238; pneumonia, 2243; rheumatism, 2406; tuberculosis, 2930; tumor, 2933; typhoid fever, 2952; typhus fever, 2953.
Diseases of Plants, 803; plants, 2232. typhus fever, 2953.
Diseases of Plants, 803; plants, 2232.
Dismal Swamp, 803.
Dismal Swamp Canal, 803, 3055.
Dispersion of Light, 2369.
Disraeli, Isaac, 803.
Disraeli, Isaac, 803. Dissenters, or Independents, 652. Dissenters, or Independents, 652. Distaff, 803, 2709. Distemper, 803, 2212. Distillation, 803, 57, 3138. Distribution (biology), 297, 1112. District of Columbia, 804, 2977. District of Dittany, 9. Divers, 805 Divide, or Watershed, 805, 242, 2425. Divination, 805; oracle, 2044; necromancy, Divine Comedy. See DANTE, 750. Divine Right of Kings, 805. Diving, 805. 2133, 2713. Diving Bell, 805. Division of Labor, 806, 474, 1525. Divorce, 806, 292, 1714. Dix, Dorothea Lynde, 807. Dix John Adams 807. Dix, John Adams, 807.
Dix, Morgan, 807.
Dixie, 807, 913.
Dixon, Ill., 807.
Dnieper River, 808, 2467. Dniester River, 808, 193. Doane, George Washington, 808. Doane, William Croswell, 808.

Dobb's Ferry, N. Y., 808.
Dobrudja, 2460.
Dobson, Henry Austin, 808.
Dock, 808; dry docks, 809.
Dodder, 809, 2104.
Doddridge, Philip, 809.
Dodge, Greenville Mellen, 809.
Dodge, Mary Abigail, 809, 2327.
Dodge, Mary Elizabeth Mapes, 810.
Dodgson, Charles Lutwidge, 810.
Dodo, 810.
Dodona, 810. Dodo, 810.
Dodona, 810.
Dog, 810, 283, 2246, 2698.
Dogbane, 812, 458.
Dog Days, 812.
Dogfish, 812.
Dogger Bank, 812.
Dogma, 812.
Dog Star See Sirius 264 Dogma, 812.
Dog Star. See Sirius, 2643.
Dog Violet, 812, 3051.
Dogwood, 812, 679.
Dole, Nathan Haskell, 812.
Dole, Sanford Ballard, 812, 1267.
Doll, 812; Teddy bear, 812.
Dollart, 812, 1826.
Dollart Gulf, 813.
Döllinger, Johann, Joseph Jonaz Dollart Gult, 813.

Döllinger, Johann Joseph Ignaz, 813.

Dolliver, Jonathan Prentiss, 813.

Dolly Varden Trout, 813, 403.

Dolomite, or Magnesium Limestone, 813.

Dolphin, 813, 2277.

Dome, 814; roof, 2446.

Domenichino, or Domenico Zampieri, 814, 9081 2081.
Domesday Book, 814.
Domingo, Saint. See San Domingo, 2516.
Dominic, Saint, 814, 815.
Dominica, or Dominique, Island, 815.
Dominical Letter, 815.
Dominican Republic. See San Domingo, 2516.
Dominicans, 815, 1390, 1824.
Dominicans, 815, checkers, 544.
Dominican, Titus Flavius, 815, 2444, 3038.
Dom Luis, or Louis I., 2288.
Dom Pedro I., of Brazil, 2139, 364.
Dom Pedro II., of Brazil, 2140, 364.
Don River, 815, 201.
Donaldson, James, 816. 2081. Donaldson, James, 816. Donaldsonville, La., 816. Donatello, or Donato, 816, 1136, 2570. Donati, Giovanni Battista, 816. Donati's Comet, 639, 816. Don Carlos, 2103, 2186, 2698. Donelson, Fort, 816, 1180. Dongola, 816. Donelson, Fort, 816, 1180.

Dongola, 816.

Doniphan, Alexander William, 816.

Donizetti, Gaetano, 816.

Don Juan, 817.

Donkey. See Ass, 167.

Donna Marina, 683.

Donnelly, Ignatius, 817.

Donnybrook Fair, Ireland, 968.

Don Quixote. See Cervantes, 524.

Dora D'Istria, 817.

Dorchester, New Brunswick, 817.

Dorchester Heights, Battle of, 1198.

Dordrecht, or Dort, Netherlands, 817.

Doré, Paul Gustave, 817, 751, 3080.

Doremus, Sarah Platt, 817.

Doria, Andrea, 818.

Doria Family, 818.

Dorian Invasions, 1195.
Dorians, 818, 1195.
Doric Order, 818, 132, 637.
Dorion, Sir Antoine Aimé, 818.
Dormant. See Hibernation, 1298.
Dormouse, 818, 1864.
Dorr, Thomas Wilson, 818.
Dorr's Rebellion, 819, 2409.
Dorsey, James Owen, 819.
Dortmund, Germany, 819.
Douay, or Douai, 819, 288.
Doubleday, Abner, 819.
Double Stars, or Binary Stars, 819, 2729.
Douglas, Great Britain, 819, 1689.
Douglas, George, 139.
Douglas, George, 139.
Douglas, William Lewis, 820.
Douglass, Davis Bates, 820.
Douglass, Frederick, 821. Douglass, Davis Bates, 82 Douglass, Frederick, 821. Doum Palm. See Palms, 2088. Douro River, 821, 2694. Douro River, 821, 2694.
Dove, 821, 2212.
Dover, Del., 821, 775.
Dover, England, 821.
Dover, N. H., 821.
Dover, N. J., 821.
Dover, Strait of, 822, 1045.
Dow, or Dou, Gerard, 822.
Dow, Neal, 822, 2319.
Dowden, Edward, 822.
Downie, John Alexander, 574.
Down (in birds), 297, 982.
Downing, Andrew Jackson, 8 Downing, Andrew Jackson, 822. Doyle, Arthur Conan, 822. Drachma, or Drachm, 822. Draco, 823. Drafting, or Conscription, 823 Dragon, 823, 265, 1296. Dragon Fly, 823. Dragon Tree, 823. Dragon Tree, 823.
Drainage Canal, 555.
Draining, 824; tile-draining, 39; tile, 2879.
Drake, Friedrich Johann, 824, 2570.
Drake, Joseph Rodman, 824, 86.
Drake, Sir Francis, 824, 146, 855, 2077.
Drakenberg Mountains, 825.
Drake University, 825, 788.
Drama, 825; comedy, 638; masque, 1726; miracle plays, 1805; opera, 2041; theater, 9855 Draper, Andrew Sloan, 826.
Draper, Henry, 826.
Draper, John Christopher, 827.
Draper, John William, 827, 16, 2202.
Drave River, 827, 1338.
Dravidians, 827, 2812.
Dravidians, 827, 2812. Dravidians, 827, 2812.
Drawbridge, 371.
Drawing, 827, 2080.
Drayton, William Henry, 827.
Dreadnaught, 2733, 3087, 3280.
Dreams, 827, 1852; sleep, 2652.
Dredging, 828; oyster, 2073.
Dred Scott Decision, 828, 1063, 2814.
Dreibund, 828, 196; Dreikaiserbund, 62, 99.
Dr. Jekyll and Mr. Hyde, 2743.
Dresden, Germany, 828, 1128.
Dresden, Battle of, 829.
Dresha, Battle of, 1309.
Dress, 829, 2961; fashion, 979.
Dreux. Battle of, 1334, 1840. Dreux. Battle of. 1334. 1840.

Drew, Daniel, 830. Drew, John, 831. Drew Theological Seminary, 830. Drew, John, 831.
Drew Theological Seminary, 830.
Drexel, Anthony Joseph, 831.
Dreyfus, Alfred, 831, 3223.
Dreyfus, Alfred, 831, 3223.
Dreyse, Johann Nicholas, 831.
Drift, 831, 2515.
Drill, 832; drilling, 793.
Drilling, 832; sowing machine, 2693.
Dromedary, 832, 446.
Dropsy, 374, 1433, 2590.
Drowning, 832; swimming, 2791.
Druggist, 119; drugs, 2179, 2180.
Druidical Circles, 2750.
Druids, 832; stone circles, 2750.
Druids, United Ancient Order of, 274.
Drum, 833; ear, 853.
Drummond, Henry, 833, 834.
Drummond, William, 833.
Drummond, William Henry, 833.
Drummond, William Henry, 833.
Drummond Light, 834.
Drummond Light, 834.
Drummond's Phlox, 2196.
Drunkenness, 777; total abstinence, 2901.
Drupes, 1425. Drumkenness, 777; total abstinence, Drunkenness, 777; total abstinence, Drupes, 1425.
Drury College, 1812.
Druses, 834, 1557.
Drusilla, 984.
Dryades, 834, 2010.
Dryden, John, 834, 919.
Dry Docks, 809.
Drying Oil, 834, 2025.
Dry Tortugas, Islands, 835, 1016.
Dual Alliance, 828.
Duane, James Chatham, 835.
Du Barry, Marie Jeanne Bécu, 835.
Dublin, Ireland, 835, 1406.
Dublin, University of, 835, 1406.
Dubois, Fred T., 836.
Dubois, Fred T., 836.
Dubois, Théodore, 836.
Dubouque, John 1403.
Dubuque, Julien, 1403.
Ducat, 836.
Du Chaillu, Paul Belloni, 836, 2021.
Duck, 837, 1083, 2609, 2831 Drunkenness, 777; total abstinence, 2901. Ducat, 836.
Du Chaillu, Paul Belloni, 836, 2021.
Duck, 837, 1083, 2609, 2831.
Duckbill, or Water Mole, 837, 1830.
Ducking Stool, 837.
Ducking Stool, 837.
Ducking Stool, 837.
Ductility, 837, 107.
Dudevant. See Sand, 2515, 2327.
Dudley, Earl of Warwick, 878.
Dudley, Joseph, 838.
Dudley, Joseph, 838.
Dudley, Robert, 1499, 1565, 2629.
Dudley, Thomas, 838.
Duel, 838, 1242, 2373.
Duero, or Douro. See Douro, 821.
Duff, Alexander, 838.
Duff, Gen. James, 1892.
Dufferin and Ava, Marquis of, 838.
Duffy, Charles Gavan, 839.
Dugong, 839, 1687, 1689, 2643.
Du Guesclin, Bertrand, 839.
Dühring, Eugen Karl, 839. Dühring, Eugen Karl, 839.
Dühring, Eugen Karl, 839.
Duisburg, Germany, 839.
Dulcimer, 840, 2208.
Duluth, Minn., 840, 1800.
Duma, or Douma, 840, 2471.
Dumas, Alexandre, 841.

Dumas, Alexandre Davy, 840, 1048.
Dumas, Jean Baptiste, 57.
Du Maurier, George Louis, 841.
Dumbarton, Scotland, 841.
Dumóries, Scotland, 841, 413.
Dumouriez, Charles Francois, 841, 2882.
Düna, or Southern Dwina, River, 842, 2467.
Dünaburg, or Dvinsk, Russia, 842.
Dunbar, Paul Lawrence, 842.
Dunbar, Paul Lawrence, 842.
Dunbar, William, 842, 2563.
Duncan, Malcom, 1656, 2563.
Dundee, Scotland, 842, 2563.
Dundee, Scotland, 842, 2563.
Dune, 842, 2515.
Dunedin, New Zealand, 843.
Dunkirds, 843.
Dunkirds, 843.
Dunkirk, N. Y., 843, 1958.
Dunkirk, or Dunkerque, France, 843.
Dunmore, Pa., 843.
Dunmore, John Murray, Earl, 843.
Dunmore, John Murray, Earl, 843.
Dunne, Edward F., 1871.
Dunne, Finley Peter, 843.
Duns, John, or Duns Scotus, 844.
Dunstan, Hannah, 1265.
Dunstan, Hannah, 1265.
Dupin, Armantine, 2515.
Dupleix, Joseph François, 844.
Düppel, Germany, 844.
Düpuesne, Fort, 355, 3096.
Duquesne, Pa., 845.
Duramen, or Heartwood, 56.
Durand, Asher Brown, 845.
Durango, Colo., 845; Durango, Mexico, 845.
Durango, Colo., 845; Durango, Mexico, 845.
Durann, South, Africa, 845, 1901.
Dürer, Albrecht, 845, 923, 2570, 3179.
Durham, England, 846.
Durham, John George Lambton, 846.
Durham, John George Lambton, 846.
Durham, Stephen, 2593.
Düsseldorf, Germany, 846, 1128.
Dutch, 847, 1927. Duryea, Joseph Tutnii, 840.

Duse, Eleonora, 846.

Dushan, Stephen, 2593.

Düsseldorf, Germany, 846, 1128.

Dutch, 847, 1927.

Dutch East Indies, 847.

Dutch Guiana, or Surinam, 847, 1214.

Dutch Literature, 1927.

Dutch Reformed Church, 1926.

Duties, 847, 731, 2819.

Duyckinck, Evert Augustus, 847.

Dvina, or Dwina. See Dwina, 848.

Dvorák, Antonin, 847, 1879.

Dwarf, 847; giants, 1136.

Dwarf Birch, 297.

Dwarfing, 848, 1615.

Dwight, Theodore, 848.

Dwight, Theodore William, 848.

Dwight, Timothy, 848, 86.

Dwight, William Buck, 848.

Dwina, or Dvina, River, 848, 2467.

Dyaks, 848, 342, 2825.

Dyeing, 849, 104, 229, 614, 1527.

Dyer's Broom, or Dyer's Weed, 849.
Dynamics, 849.
Dynamice, 849, 1980.
Dynamo-Electric Machine, 850, 893, 894, 895, 896.
Dynamometer, 851.
Dynasty, 851; Bourbon, 350; Capetian, 472; Hanover, 1249; Hapsburg, 1250; Hohenzollern, 1311; Merovingian, 1762; Stuart, 2762.
Dyne, 851; megadyne, 851.
Dysodile, 851.
Dyspepsia, 1274, 2749.
Dyticidae, 851.
Dziggetai, 851.

E

E, 852, 1879, 2198, 2951. E, 602, 1019, 2198, 2991. Eads, James Buchanan, 852, 372. Eads's, or Saint Louis, Bridge, 372, 852, 2496. Eagle, 852, 1256, 1268. Eagle (coin), 853, 620. Eagle Island. See АСНІЦ, 14. Eagle (symbol), 853. Eagle City, 50. Eagle City, 50.
Eagle Ray, 2379.
Eagre. See Bore, 340.
Eames, Emma, 853.
Ear, 853; senses, 2208, 2327.
Early, Jubal Anderson, 854, 515, 2672. Earring, 854. Earth, 854, 1114; circumnavigation, 1673; eclipse, 865; geography, 1112; geology, 1114; gravitation, 1183; latitude, 1547; longitude, 1626; physiography, 2206; zone, 3224.

Earth Currents, 857.

Earthenware, 857, 2295.

Earthut, 857.

Earthquake, 857: Isobia, 1416; Lima, 1592; Lisobia, 1 Earthquake, 857; Ischia, 1416; Lima, 1592; Lisbon, 1601; Pompeii, 2267; San Francisco, 858, Earths, 858. Earth Shine, 858. Earthworks, 1035, 1861. Earthworm, or Angleworm, 858. Ear Trumpet, 859, 2679. Earwig, 859. East Mills, 659; right of way, 2421. East Africa, British, 378, 33. East Africa, German, 1123, 1127. East Africa, Portuguese, 2288, 33. East Aurora, N. Y., 859. East bourne, England, 859. East Cape, 859, 280. Easter, 859, 925, 1164. Eastern Empire, 422, 2244. Eastern Question, 860. Eastern Rumelia, 860. See Rumelia, 2462. Eastern Kumelia, 860. See Rume Eastern Time, 2722. Easthampton, Mass., 860. East Hartford, Conn., 860. East India Companies, 860, 1377. East Indies, 860, 162, 341, 1444. Eastlake, Sir Charles Locke, 860. East Liverpool, Ohio, 861. Eastman. Elaine Goodale, 861. Eastman, Elaine Goodale, 861. Easton, Pa., 861. East Orange, N. J., 861. Eastport, Me., 861.

East Providence, R. I., 861. East River, 861, 381, 1959. East River Bridge, 381, 1962. East Saint Louis, Ill., 861, 2495. East Sea, 220. Eaton, Dorman Bridgman, 862. Eaton, John, 862. Eaton, Margaret O'Neill, 862. Eau Claire, Wis., 862, 3169. Eau de Cologne, 626. Ebers, Georg Moritz, 862, 2004. Ebner-Eschenbach, Marie, 863. Ebony, 863, 2166.
Ebullition. See Evaporation, 952.
Ecarté, 863; cards, 481.
Ecbatana, 863, 1747.
Eccentric, 863, eccentricity, 906. Ecclesia, 863. Ecclesiastes, 863, 289. Ecclesiasticus, 863, 118, 289. Echidna, 864, 1831. Echinodermata, 864; echinoidea, 2576. Echo, 864, 1897. Echo (sound), 864, 2679. Eck, Johann Maier von, 864, 1647, 2073. Eckford, Henry, 864. Eclectics, 865; eclecticism, 2196. Eclectic School of Medicine, 865, 1749. Eclipse, 865, 173, 1842. Ecliptic, 866, 856. Eclogues, 867.
Economics. See Political Economy, 2254.
École des Beaux Arts, 867. École des Beaux Arts, 867.
Equador, 867, 627.
Edda, 868, 1999, 2546.
Eddy, Clarence, 868.
Eddy, Mary Baker Glover, 868, 575.
Eddvstone Lighthouse, 869, 1590, 2655.
Eden, 869, 945, 1688.
Edentata, 869, 110, 146.
Edgar, 869, 922.
Edgar, Sir James David, 869.
Edgar Atheling, 869.
Edgar Atheling, 869.
Edgeworth, Maria, 870. Edgeworth, Maria, 870.
Edict of Nantes, 1891, 1334, 1632, 1840.
Edictum Perpetuum, 1229.
Edinburgh, Scotland, 870, 157, 1187.
Edinburgh, Alfred Alexander, Duke of, 870.
Edinburgh University, 870, 2997.
Edinburgh Review, 871, 2659.
Edison, Thomas Alva, 871, 892, 2199, 2838.
Edmonton, Alberta, 871, 55.
Edmund I., of England, 871, 922, 2563.
Edmund II., of England, 871, 844, 922, 2563.
Edmunds, George Franklin, 871, 889.
Edom, or Idumaea, 872, 1456.
Edomites, 872, 935, 1456.
Education, 872, 2553; academy, 11; coeducation, 618; college, 623; common schools, 642; in-Edgeworth, Maria, 870. 618; college, 623; common schools, 642; industrial schools, 1386; German universities, 1124; kindergarten, 1507; military schools, 1786; naval academy, 1908; pedagogy, 2135; physical, 2205; polytechnic, 2265; Sunday schools, 2777; teachers' institute, 2830; university, 2996. Education, Commissioner of, 875, 383. Education, Compulsory, 875, 1127. Educational Association, 876. Edward, the Black Prince, 876, 877, 2247. Edward, the Confessor, 876, 922.

Edward, the Elder, 876. Edward, the Martyr, 876. Edward I., of England, 876, 386, 922, 2564. Edward II., of England, 877, 922, 2072, 2840. Edward III., of England, 877, 433, 922, 2186, 2564, 3161. 2564, 3161.
Edward IV., of England, 877, 922, 2413, 3208.
Edward V., of England, 878, 922, 2413
Edward VI., of England, 878, 922, 1205, 1723.
Edward VII., of Great Britain, 878, 922, 3046.
Edwards, Amelia Blandford, 878.
Edwards, Jonathan, 878, 85, 359, 2312.
Edwy, 879, 922.
Eel, 879, 1536; electric eel, 879.
Effervescence, 587, 2580.
Effer 1053 Eft, 1953. Egan, Maurice Francis, 879. Eghert, of Wessex, 879, 1289. Egg, 879, 2297; incubation of, 880. Eggleston, Edward, 880, 89. Eggleston, George Cary, 880. Eggplant, 880. Eggs, Nutrition of, 2009. Eginhard, or Einhard, 880. Egmont, or Egmond, Lamoral, Count of, 880. Egoism, 881; consciousness, 658. Egnont, or Egnond, Lamoral, Count of, 880.
Egoism, 881; consciousness, 658.
Egret, 881; heron, 1294.
Egypt, 881, 1299, 2339; Abydos, 10; architecture, 132; catacombs, 503; Copts, 670; Fellahs, 984; glass, 1149; hieroglyphics, 1299; Hyksos, 1353; Isis, 1416; Karnak, 2856; labyrinth, 1527; Mamelukes, 1687; Memnonium, 2857; mummies, 1868; national emblem, 1020; obelisks, 2013; pottery, 2295; pyramids, 2339; Scarabaeus, 2546; sculpture, 2569; Sudan, 2767; Suez canal, 2768.
Egyptology, 884, 1573.
Ehrenbreitstein, Germany, 884.
Eider Duck, 884; king eider, 885.
Eiffel, Gustave, 885.
Eiffel Tower, 885, 2108, 2527.
Eight-Hour Day, 885, 1526.
Eisenach, Germany, 885.
Eisleben, Germany, 885.
Ekaterinburg, Russia, 886. Ekaterinburg, Russia, 886 Ekaterinodar, Russia, 886.
Ekaterinodar, Russia, 886.
Elam, 886; Susa, 2782.
Eland, 886, 111.
Elasticity, 886; compressibility, 886.
Elba, Island, 886, 91, 1896.
Elbe River, 887, 2419.
Elberfeld, Germany, 887, 900.
Elberon, N. J., 1097.
Elbing, Germany, 887.
Elbruz, Mount, 512, 2467.
Elburz Mountains, 887, 498, 2163.
El Caney, Battle of, 887, 525, 2982.
Elder, 887; pith, 2224.
Eldon, Baron, 887.
El Dorado, 887, 2052.
Eldorado, Kans., 888.
Eleatic Philosophy, 2195.
Eleazar, 2, 1300; Levites, 1577.
Elecampane, 888. Ekaterinodar, Russia, 886. Elecampane, 888. Election, 888, 2768, 3064, 3068. Elective Courses, 888. Elective Courses, 888. Elective Franchise, 1050; suffrage, 2768. Elector, or Prince Elector, 889. Electoral College, 889; electors, 2975. Electoral Commission, 889, 1271, 2879. Electra, 34, 2052. Electric Battery, 1090, 197.

Electric Clock. See CLock, 605. Electric Currents, 896, 1090. Electric Fish, 889, 2379; eel, 879. Electric Generator, 850. Electric Heating, 890, 891, 2860. Electricity, 890, 81, 147, 1090, 1580, 1590, 2849, Electricity, Medical Use of, 892, 3197. Electric Lamp, 893, 1536. Electric Light, 893; arc light, 134, 1010. Electric Machine, 894, 2630. Electric Meter, 894. Electric Motor, 894. Electric Railway, 895, 359, 2630. Electric Ray Fish. See ELECTRIC FISH, 889 2379 Electrification, 891. Electrification, 891.
Electro-Chemistry, 896.
Electro-Culture of Plants, 896.
Electrocution, 896, 475.
Electrode, 896; cathode ray, 508.
Electrograph, 892; phototelegraphy, 2203.
Electrolysis, 896, 1766.
Electro-Magnetism, 896.
Electro-Magnetism, 896.
Electro-Magnetism, 896. Electro-Magnetism, 896. Electrometer, 897. Electro-Motive Force, 897, 891. Electroscope, 891, 897. Electrotyping, 897, 1141, 2950. Elegy, 898. Elektron, 81, 890. Elektron, 81, 890.
Elements, 898, 546.
Elephant, 898, 1687, 1733.
Elephanta Island, 899.
Elephant Beetle, 899.
Elephant Fish, 899.
Elephantiasis, 899, 1573.
Elephantine, Island, 899; Assuan, 170.
Elephant Seal, 899. Eleusis, Greece, 899; Eleusinian mysteries. 900. 1885. 1885.
Eleuthera, Island, 900.
Elevated Railway, 900, 553, 1962.
Elevator, 900; grain elevators, 1176.
Elf. See Fairies, 969.
Elfrida, 876.
Elgar, Sir Edward William, 900.
Elgin, Ill., 901, 3099.
Elgin, Lord, 901.
Elgin Marbles, 901.
El-Haram. Mecca, 1746. Elgin Marbles, 901.
El-Haram, Mecca, 1746.
Eli, 901, 2514, 2615.
Elia, Essays of, 1535.
Elijah, 901, 903, 2320.
Eliot, Charles William, 901, 875.
Eliot, George, 902, 920, 2327.
Eliot, John, 902, 84, 1730, 1954.
Eliot, Sir John, 902.
Eliot, Samuel, 903, 875.
Eliphaz, 3008. Eliot, Santier, 300, 513. Eliphaz, 3008. Elisha, 903, 901, 2320. Elizabeth, N. J., 903, 1945. Elizabeth, of Austria, 903, 1052. Elizabeth, of England, 903, 160, 922, 1723, 2371, Elizabeth, of Rumania, 903, 536. Elizabeth, of Kuhlaha, 303, 306 Elizabeth, of Spain, 2187. Elizabeth, Saint, 904, 368, 3088. Elizabeth City, N. C., 904. Elizabeth Islands, 904. Elizabeth Stuart, 904. Elizabethan Age, 919.

Elk, or Moose Deer, 904, 771. El-Kazib, Mount, 1557. Elkhart, Ind., 905. Elkhorn River, 905, 1912. Elkins, Stephen Benton, 905. Elks, Order of, 905, 274. Ellery, William, 2995. Ellesmere Land, 905. Ellet, Charles, 905. Ellice Islands, 2264 Elliot, Charlotte, 1353, 3249. Elliott, Jesse Duncan, 906. Ellipse, 906; in astronomy, 1503. Ellis, Edward S., 89. Ellis, Edward S., 89.
Ellis, George Edward, 906.
Ellsworth, Ephriam Elmer, 906.
Ellsworth, Oliver, 906.
Ellsworth, Oliver, 906.
Ellwood, Thomas Crowell, 906.
Elm, 906; wych hazel, 3171.
Elmira, N. Y., 906, 1958.
Elmo's Fire, Saint, 907.
Elocution, 778, 2380.
Elora, or Ellora, Hindustan, 907.
El Paso, Tex., 907, 2853.
El Reno, Okl., 907.
Elkswatawa, 2832.
Elves, 907; fairies, 969.
Elwood, Ind., 907.
Ely, England, 907.
Ely, Richard Theodore, 907.
Elyria, Ohio, 908.
Elysium, or Elysian Fields, 908, 2 Elyria, Ono, 908. Elysium, or Elysian Fields, 908, 2241. Elzevir Family, 908. Emancipation, 908, 111, 1595, 2651. Emanuel I., of Portugal, 908. Embalming, 909, 1868. Embargo, 909. Embargo, 909.
Ember Days, 909, 979.
Embossing, 909: bas-relief, 243.
Embroidery, 909. 1916.
Embryo, 1132, 2579.
Embryology, 910, 3225; botany, 9346.
Emerald, 910, 2750.
Emerald Isle, 910, 1405.
Emerson, Ralph Waldo, 911, 87, 1606.
Emery, 911: abrasive, 8 Emerson, Ralph Waldo, 911, 87, 1606. Emery, 911; abrasive, 8. Emery, A. H., 2760. Emery Paper, 911, 2517. Emetic, 2821; antidote, 112. Emigration, 911, 1784; naturalization, 1905. Emile, 1048, 2456. Emile, 1048, 2456. Emile, 1048, 2456.
Emile, 1048, 2456.
Eminent Domain, 912.
Emin Pasha, 912, 2725.
Emmerson, James, 361.
Emmett, Robert, 912.
Emmett, Daniel Decatur, 913.
Emotions. See Feeling, 984.
Empedocles, 913, 2771.
Emperor, 913, 737, 1484.
Empire State, 1956.
Empire State of the South, 1119.
Empiricism, 913, 2196.
Emporia, Kans., 913, 1490.
Ems, Germany, 913.
Emu, or Emeu, 913, 122, 500.
Emulsion, 913, 617.
Enamel, 914, 1973, 2848.
Enara, Lake, 1543.
Enarea, 914, 10.
Encaustic Painting, 914; gilding, 1141.
Encke's Comet, 640.

Encyclopaedia, or Cyclopaedia, 914.
Enderby Land, 110, 2251.
Endicott, John, 915, 1730.
Endicott, William Crowinshield, 915.
Endlicher, Stephen Ladislaus, 1299.
Endogens, 915, 688; exogen, 959.
Endosmose (circulation), 585, 2527.
Endymion, 915.
Enemy, 915; war, 3080.
Energy, 915; heat, 1275; light, 1587.
Enfield, Conn., 916.
Enfield, England, 916.
Enfield, England, 916.
Enfield Rifles, 2420.
Eng and Chang, 2625.
Engel, Ernst, 916.
Engelmann, George, 916.
Engine, 916, 677, 1101, 2366.
Engine, 916, 677, 1101, 2366.
England, 917, 1186; Afghanistan, 28; bank of, 225; Boers, 322; cabinet, 425; Cade's Rebellion, 428; cavaliers, 512; christianity, 1202; Civil War, 536, 710, 921; colonies, 2979; Crimean War, 705; debt, 767; dynasties, 922; free trade, 1063; gunpowder plot, 1221; heptarchy, 1289; literature, 918; Magna Charta, 1674; Monmouth's Rebellion, 1829; national emblem, 1020; Norman Conquest, 1254, 3151; parliament, 2111; Peninsular War, 2148; Puritans, 2337; Quadruple Alliance, 2343; reformation, 2388; Rye-House Plot, 2478; slavery, 2650; witchcraft, 3171.
England, Church of, 922, 928.
Englewood, N. J., 923. 2650; witchcraft, 3171.
England, Church of, 922, 928.
Englewood, N. J., 923.
English, William Hayden, 923.
English Channel, 917, 532, 822.
English Language. See England, 918.
English Literature. See England, 918.
English People, 103.
English Settlements, 1436, 1989, 2979.
Engraving, 923; cameo, 447; glass, 1150; lithography, 1607; photogravure, 2202; wood, 3178. Enid, Okl., 924, 2029. Ennius, Quintus, 924. Enoch, 924; Book of, 924. Enrico, of Venice, 749. Ensign, National, 1008; (officer), 2394. Ensilage, 924, 1269.
Entomology, 925, 1767, 3225.
Entophytes, 2104.
Entozoa, 925; tapeworm, 2816; trichina, 2918.
Envelopes, 925; flower, 1020. Environment, 925. Eocene, 925, 1115. Eos, 186, 2054, 2581. Eozoic, 925, 1115. Epact, 925. Epaminondas, 926, 2857. Ephesians, Epistle to the, 289. Ephesus, Asia Minor, 926, 166, 2594. Ephraim, 926, 1455. Epic, 926, 1315, 2245, 3053. Epictetus, 926. Epicterus, 920.
Epicureanism. Sec Epicurus, 926.
Epicureans, 927, 1194, 2196.
Epicurus, 926, 939, 1194.
Epidemic, 927, 572, 1387.
Epidermis, 927, 2647.
Epigenesis, Theory of 910.
Epiglottis, 1545, 2401.
Epigram, 927.
Epilensy, or Falling Sickness 927. Epilepsy, or Falling Sickness, 927.

Epileptics, 927. Epiphany, 928. Epiphytes, 2104. Epirus, Greece, 928, 354. Episcopal Church, 928, 923. Epistles of Paul, 289, 2125. Epitaph, 928. Epithelium, 928, 854. Epizoa, 928; bedbugs, 257; flea, 1012; louse, 1638. Epizoötic, 928; influenza, 1387. E Pluribus Unum, 928. Epoch, or Era, 928; age, 35.
Epping Forest, 929.
Epsom, England, 929.
Epsom Salt, or Magnesium Sulphate, 929, 1507. Epworth League, 929, 1769. Equality State, 3191. Equal Rights Party, 1615. Equator, 929, 855, 3224. Equatorial Telescope, 929. Equatorialle, 652 Equatorville, 652. Equestrian Order, or Equites, 929. Equinox, 929, 866; precession of, 2302. Equitable Aid Union, 274. Equitable Aid Union, 274. Equity, 930. Equivalves, 615, 1882. Era, 577, 928; age, 35; calendar, 435. Era, Moslem, 1278. Era of Good Feeling, 930, 1831. Érard, Sébastien, 930. Erasistratus, 930. Erasmus, Desiderius, 930, 241, 846, 919. Erastus, Thomas, 930. Erastus, Th Erato, 1878. Eratosthenes, 1113, 64. Erbium, 547. Erckmann-Chatrian, 931. Erebus, 931, 540. Erebus and Terror, 931, 110, 2452. Erechtheum, 931. Erechtheum, 931.
Eredia, Manoel Godinho de, 191.
Erfurt, Germany, 931.
Ergot, 931; fungi, 1078.
Eric, 931, 1999, 2788.
Ericsson, John, 931, 1827, 1911.
Ericsson, or Eric, Lief, 932, 1359, 1995.
Eric the Red, 932, 2978.
Erie, Pa., 932, 2151.
Erie, Battle of Lake, 932.
Erie Canal, 932, 458, 1964, 2586.
Erie, Fort, 933.
Erie, Lake, 933, 1533, 2162.
Erigena, John Scotus, 2553. Erigena, John Scotus, 2553. Eritrea, or Erythrea, 933, 33, 1421. Erman, Adolf, 933. Ermine, or Stoat, 933, 3110. Erne River, 934. Eros, 725, 1486. Erosion, 934, 3013; geology, 1114. Erratic Blocks, or Erratics, 934. Erromango, 1943. Erskine, Thomas, Lord, 934, 727. Erysipelas, 934. Erzerum, Turkish Armenia, 934. Erzgebirge Mountains, 934, 193, 323, 2542. Esarhaddon, 935, 171. Esau, 935, 872. Escanaba, Mich., 935. Escapement, 935, 605, 3135. Escobedo, Mariano, 935. Escurial, or Escorial, 935. Esdraelon, or Plain of Jezreel, 935, 485, 2084.

Esdras, Books of, 936, 118, 289. Eskimos, 936, 50, 941, 3077. Eskimo Dog. See Eskimos, 936. Esmarch, Johannes, 936. Esophagus, or Aesophagus, 69, 95, 2748. Esparto, 936, 982, 993. Esperanto, 937, 3060. Espiritu Santo, 1943. Esquiline Hill, 2441. Esquime Hill, 2441.
Esquimalt, British Columbia, 937, 3043.
Essay, 937; treatise, 937.
Essen, Germany, 937, 1522.
Essequibo River, 937.
Essex, 938, 2279, 3084.
Essex Institute, 2503.
Essex, Robert Devereux, Earl of, 938.
Esseling or Aspern, Battle of, 1731. Essling, or Aspern, Battle of, 1731. Estate, 938; life estate, 938. Esterhazy, Major, 831. Esternazy, Major, 661.
Esther, 938.
Esther, Book of, 938, 289; Apocrypha, 118.
Esthetics. See Aesthetics, 27.
Esthonia, Russia, 219. Estuary, 2233, 2293. Etching, 923, 1979, 3221. Etesian Winds, 938. Etesian Winds, 938, Ethelbert, of Kent, 938. Ethelbert, of England, 939. Ethelred I., 939, 876. Ethelwald, 876. Ethelwulf, 939. Ether, 939, 962, 1587. Ether (liquid), 939. Ethers, or Moral Science, 99 Ether, 939, 962, 1587.
Ether (liquid), 939.
Ethics, or Moral Science, 939, 2559.
Ethiopia, 940, 2004, 2340; race, 941, 1688.
Ethnology, 940; Anglo-Saxons, 103; Aryans, 159; Aztecs, 201; Basques, 243; Caucasians, 512; Celts, 518; Cimbri, 582; Circassians, 585; Copts, 670, 883; Cossacks, 685; Czechs, 737; Dorians, 818; dwarfs, 847; Ethiopian, 940; facial angle, 966; Goths, 1170; Huns, 1340; Indians, 1382; Indo-European, 1385; Iranians, 1404; Jews, 1455; Kafir, 1484; Laos, 1542; Lithuanians, 1607; Lombards, 1620; Malays, 1684; Mahrattas, 1678; Mongolians, 1826; Moors, 1844; Mound Builders, 1861; Negroes, 1918; Pelasgians, 2142; Philistines, 2192; Picts, 2210; Scythians, 2571; Semites, 2584; Shans, 2605; Slavs, 2651; Suliots, 2771; Teutons, 2850; Turanians, 2936; Turks, 2944; Vandals, 3017; Walloons, 3076.
Etiolation, 941; celery, 516.
Etna, or Aetna, 942, 504, 2627.
Eton College, 942, 1286.
Etruria, 942, 2820.
Etruria, 1taly, 943.
Etruscans, 942, 2442.
Etruscan Vases. See Etruria, 943.
Etsch (Adige), 22.
Ettingen, Battle of, 2542.
Etti, William, 943. Etsch (Adige), 22.
Ettingen, Battle of, 2542.
Etty, William, 943.
Etymology, 943, 1177; philology, 2194.
Euboea, Island, 943, 526.
Eucalyptus, 943, 190.
Eucharist, 74, 369, 2481.
Euchre, 944, 482, 2645.
Euclid, 944, 873, 883, 1116.
Euclid Avenue, Cleveland, 600
Eudiometer, 944.
Eudoxus, 1280. Eudoxus, 1280.

Eufaula, Ala., 944. Eugene, Or., 944. Eugène, François, 944, 312. Eugène de Beauharnais, 3209. Eugènie, Marie de Montijo, 945, 1897. Eugènie, Marie de Montijo, 945, 1897. Eugenius III., 2273, 3023. Eulenspiegel, Till, 945. Euler, Leonhard, 945. Eumenides, 2020. Euphrates River, 945, 164, 759, 873. Eurasia, 945, 946. Eurasians, 946. Eure River, 946. Eureka, 946, 131. Eureka, Cal., 946. Eureka, Utah, 946. Euripides, 946, 2677. Europa, 946, 428; satellite, 1479. Europa, 940, 428, satellite, 1413. Europa Point, 1138. Europe, 946; civilization, 588; crusades, 716; education, 874; migration, 1784; railroads, 2365; Reformation, 2388; schools, 2553; serf-dom, 2590; universities, 2996. Euryale, 1167. Eurybiades, 2503, 2858. Eurydice, 951, 1924, 2057. Eurynome, 1174. Eusden, Lawrence, 1548. Eusebius, Pamphili, 238, 951. Eustachian Tube, 951, 854. Eustachian Bartolommeo, 951. Eustachio, Bartolomineo, 951. Eustis, James Biddle, 951. Eutaw Springs, Battle of, 951, 1198. Euterpe, 951, 1878. Euxine Sea (Black Sea), 306. Evald, Johannes, 783. Evangelical Alliance, 951. Evangelical Alliance, 951.

Evangelical Alliance, 951.

Evangelical Association, 952.

Evangelical Union, 2863.

Evangeline, 11, 87, 1625.

Evans, Marian, 902, 2327.

Evans, Oliver, 952, 2366.

Evans, Robley Dunglison, 952.

Evanston, Ill., 952, 1996.

Evanston, Wyo., 952.

Evansville, Ind., 952, 1380.

Evaporation, 952, 1976, 2368.

Evarts, William Maxwell, 953.

Eve, 17, 126, 431.

Eveleth, Minn., 953.

Evening Schools, 953, 668, 831.

Everest, Mount, 954, 164.

Everest, Mass., 954.

Everett, Edward, 954, 87, 269.

Everglades, 954.

Everglade State, 1016.

Evergreen, 955, 735, 1021, 2233.

Everlasting Flower, 955, 1021, 1370.

Evidence, 955.

Evil Eye, 979.

Evolution, 955, 756, 1230, 1688, 1905. Evil Eye, 979. Evil Eye, 979.
Evolution, 955, 756, 1230, 1688, 1905.
Ewald, Georg August von, 956.
Ewell, Benjamin Stoddert, 957.
Ewell, Richard Stoddert, 957, 3147.
Ewing, Thomas, 957, 2993.
Exchange, 957, 640, 1174, 2255.
Excise, 958, 2826.
Executive, 958, 1179 Executive, 958, 2020. Executive, 958, 1178. Exequatur, 662. Exeter, England, 958. Exeter College, 958, 2072.

Exeter Hall, 959.
Exhibition. See Exposition, 959.
Exiles, Russian, 2626.
Exodus, 959, 2154.
Exogen, or Dicotyledon, 959, 915.
Expansion, 959; currents, 728.
Explorations, 135, 636, 2248, 2725.
Explosives, 959, 849, 1220, 1980.
Exposition, 959, 178, 2108, 3183.
Ex Post Facto, 960, 2986.
Express, 960, 491.
Extension, 961.
Extract, 961.
Extract, 961.
Extradition, 961.
Extreme Unction, 2481, 2959.
Eyck, Hubert and Jan van, 961, 2081.
Eye, 961, 124, 172, 312, 504.
Eyelids, 962, 1528.
Eylau, Germany, 963.
Eyre, Lake, 963, 188, 2685.
Eyre, Edward John, 963.
Eyre, Jane, 380.
Ezekiel, 964, 205, 289, 2081.
Ezekiel, Moses Jacob, 964.
Ezra, 964, 1456; Book of, 289.

F

F, 965, 1879, 2951.
Faber, A. W., 2146.
Faber, Cecilia Bohl von, 424.
Faber, F. W., 1182, 3243, 3251.
Faber, Johann Lothar, 965.
Fabian Policy, 965.
Fabian Maximus, 965, 1248.
Fable, 965, 27, 2404.
Fabricius, Caius, 965.
Fabricius, Johan Christian, 965.
Face, 966, 2646; head, 1273.
Facial Angle, 966, 941.
Factory, 966; factory system, 966.
Faculty, 967.
Faculty, in mental science, 967.
Faculty, in mental science, 967.
Faguet, Emile, 1048.
Fahlberg, Charles, 2480.
Fahrenheit, Gabriel Daniel, 967, 772, 2861.
Fairbairn, Gr; pottery, 2295.
Fainting, or Syncope, 967.
Fair, 967; bazaar, 251.
Fairbairn, Sir Andrew, 968.
Fairbairn, Sir Andrew Martin, 968.
Fairbairn, Sir William, 968.
Fairbanks, Charles Warren, 968, 2976.
Fairbanks, Erastus, 968.
Fairbanks, Thaddeus, 968.
Fairchild, James Harris, 969, 618.
Fairchild, Lucius, 969.
Fairfax, Thomas, Lord, 969.
Fairfax, Thomas, Lord, 969.
Fairfield, Iowa, 969.
Fairhaven. See Bellingham, 271.
Fairies, 969; Mab, 1654; Puck, 2329.
Fairmount, W. Va., 970.
Fair Oaks, Va., 970, 557, 1466.
Fairweather Mountain, 970.
Faith Cure, 970, 574, 575.
Faithful, Emily, 971.
Fakir, 971; Gosavee, 971.
Falashas, 10, 1243.

Falcon, 971, 1268. Falconry, or Hawking, 971.
Falk, Paul Ludwig Adalbert, 972.
Falkirk, Battle of, 877.
Falkland Islands, 972, 2681. Falkland Islands, 972, 2081.
Fallacy, 972; logic, 1619.
Falliéres, Clement Armand, 973, 1050.
Fallion Bodies, 973, 12.
Fallow Deer, 973, 771.
Fallow Land, 973; bastard fallow, 973.
Fallows, Samuel, 973. Fallows, Samuel, 973.
Fall River, Mass., 974, 2975.
False Imprisonment, 974; kidnap, 1506.
False Pretenses, 974.
Falsetto, 974; voice, 3059.
Family Compact, 974, 2383.
Famine, 974, 1377.
Fan, 974; air shaft, 43.
Fanaticiem, 975. Fan, 974; air shaft, 43.
Fanaticism, 975.
Fan-blast Machine, 271.
Fancy, 975; imagination, 1369.
Fandango, 975, 748.
Faneuil, Peter, 975.
Faneuil Hall, 345, 975.
Fan Palm. See Palms, 2088.
Farabi, of Arabia, 914.
Faraday, Michael, 975, 546, 892, 920.
Farallones, Islands, 975.
Farce. See Drama, 825.
Far Eastern Question, 975. Far Eastern Question, 975. Fared, 594.
Farel, Guillaume (William), 976, 443, 1109.
Fargo, N. D., 976, 1994.
Fargus, Frederick John, 976.
Fargust, Miss. 976. Fargus, Frederick John, 976.
Faribault, Minn., 976, 1802.
Farinelli, Carlo, 977.
Farini, Luigi Carlo, 977.
Farjeon, Benjamin Leopold, 977.
Farley, John Murphy, 977.
Farman, Henry, 1024.
Farmers' Institute, 977.
Farmers' Organizations, 977, 38.
Farming. See Agriculture, 38.
Farne Islands, or Fern Isles, 978. Farne Islands, or Fern Isles, 978, 754. Farnese (family), 978, 2208. Farnese, Elizabeth, of Spain, 2187. Farnese, Elizabeth, of Spain, 2187.
Faroe Islands, 978.
Farragut, David Glasgow, 978, 1239, 1901.
Farrar, Frederick William, 978, 3240.
Farther India, 1373.
Farthing, 979.
Farwell, Charles Benjamin, 979.
Faccination, 979. Fascination, 979. Fashion, 979, 829. Fashoda, Africa, 979, 1705. Fast, 979; forty days, 1453; Lent, 1569. Fat, 979, 1027, 1787, 2025. Fatalism, 980, 1819. Fata Morgana, 980, 1805. Fates, 980, 901, 1479, 1984. Father of English Poetry, 543. Father of Waters, 1807. Fatigue, 980, 2863. Fatima, 980, 1818. Fatimite Caliphs, 432. Fatimites, 980, 69. Fatty Degeneration, 980, 1609. Faulbourg, 981.
Fault, 981; joint; 1467; stratification, 2757.
Fauna, 105, 756.
Fauns, 981. Faunus, 981, 2091.

Faure, François Félix, 981, 1050. Faust, or Fust, Johann, 981, 2313. Faust, Johann, 981, 1158. Faustulus, 2440. Favenc, Ernest, 981. Favre, Jules, 981. Favre, Jules, 981.
Fawcett, Henry, 982.
Fawkes, Guy, or Guido, 982, 1221.
Fayal, Island, 982.
Fayetteville, N. C., 982.
Feast. See Festivals, 991. Feast. See FESTIVALS, 991.
Feast of the Holy Innocents, 1390.
Feather Grass, 982.
Feathers, 982; quill, 2144.
February, 982, 1839.
Fechner, Gustav Theodor, 983.
Federal Hall, 983. Federalist, The, 983, 1242, 1445. Federal Party, 983, 69, 779, 2256; Hartford Convention, 1260. Federal Reserve Banks, 983, 728, 780, 3158. Feeble-Minded, 983, 1363. reeble-Minded, 983, 1363. Feehan, Patrick A., 984. Feeling, 984, 2902. Feet Washing, 2481. Feldspar. See Felspar, 985. Félegyháza, Hungary, 984. Felix Antonius, 984, 991, 2126. Felix V., 79, 2274. Fellah, 984, 883. Fellowship, 984. Felspar, of Feldspar, 985, 1794. Felt. 985. Felt, 985. Felt, 985. Felt, Dorr E., 434; Felucca, 3194. Femur, 1562, 2646. Fen, 985; bog, 323. Fence, 985. 3167. Fencing, 985. Fencing, 985.
Fénelon, François de, 986.
Fénians, 986, 1408.
Fennec, 986; fox, 1042.
Fennel, 986, 1742, 2025, 2958.
Ferdinand I., of Germany, 986, 537.
Ferdinand II., of Germany, 986, 1222, 3075.
Ferdinand III., of Germany, 987, 1131.
Ferdinand I. of Castile, 987. Ferdinand II., of Germany, 986, 1222, 3075.
Ferdinand III., of Germany, 987, 1131.
Ferdinand II., of Castile, 987.
Ferdinand III., of Castile, 987.
Ferdinand III., of Castile, 987.
Ferdinand IV., of Castile and Leon, 987.
Ferdinand VI., of Spain, 987.
Ferdinand VII., of Spain, 988, 2698.
Ferdinand II., of Naples, 988.
Ferdinand II., of Naples, 988.
Ferdinand II., of Naples, 988, 1894.
Ferdinand IV., of Rumania, 988, 2462.
Ferdinand I., of Bulgaria, 988, 401.
Fergus Falls, Minn., 988.
Ferguson, James, 988.
Ferishtah, Fericht, 2165.
Fermentation, 988; beer, 261; whisky, 3138.
Fern, Fanny, 2327.
Fernandez, Juan, 989.
Fernandina, Fla., 989.
Fernando Po, Island, 989, 287.
Ferns, 989, 20, 1021.
Ferrara, Duchess of, 341.
Ferrara, Duchess of, 341. Ferrara, Duchess of, 341. Ferrara, Duke of, 341. Ferrara, Italy, 989. Farreira, Antonio de, 2287. Ferret, 990, 3110.

Ferris, George Washington Gale, 990. Ferris Wheel, 990. Ferrol, Spain, 990. Ferrol, Spain, 990.
Ferry, 990, 1962.
Ferry, Jules François Camille, 990.
Ferry, Jules François Camille, 990.
Fertilization, 315, 333, 1211, 1700, 2292.
Fertilizers, 991, 1507, 1700.
Fessenden, William Pitt, 991.
Festivals, or Feasts, 991, 576, 859, 1240, 2089, 2119, 2357, 2536, 2855.
Festus, Porcius, 991.
Fetich, or Fetish, 991, 1157, 2604.
Feudal System, 992, 2590, 2668.
Feuerbach, Ludwig Andress, 992.
Feuerbach, Paul Johann Anselm, 992.
Feuerbach, Paul Johann Anselm, 992.
Feuerbach, Paul Johann Anselm, 992.
Fever, 993; ague, 41; malaria, 1683; measles, 1744; scarlatina, 2546; smallpox, 2655; typhoid, 2952; yellow, 3203.
Feverfew, 993, 3184.
Few, William, 2989.
Fez, Morocco, 993, 1851.
Fez (hat), 993, 1851, 2937.
Fez, University of, 993.
Fezzan, Africa, 993, 2921.
Fiber, or Fibre, 993, 1284.
Fibrin, 994, 315.
Fibula, 1562, 2646.
Fichtelgebirge Mountain, 994, 249.
Fiddle, 3051. Ferry, 990, 1962. Fichtelgebirge Mountain, 994, 249. Fiddle, 3051.
Fidus (faithful), 14.
Field, Cyrus West, 994, 427.
Field, David Dudley, 995, 1157.
Field, Eugene, 995, 88.
Field, James, 978.
Field, Kate, 995.
Field, Marshall, 995.
Field, Stephen Johnson, 995, 889.
Field Glass, 996; telescope, 2838.
Fielding, Henry, 996, 919.
Field of the Cloth of Gold, 996, 1287.
Fields, James Thomas, 996.
Fiery Cross, 996.
Fiesole, Italy, 1015.
Fiesole, Fra Giovanni da, 101.
Fife, 996. Fichtelgebirge Mountain, 994, 249. Fife, 996. Fifteen Decisive Battles, 248, 699. Fifteenth Amendment, 1181, 2991. Fig, 996; fruit, 1075. Figaro, 997. Figaro, 997.
Fighting Fish, 997.
Fighting Joe. See Hooker, Joseph, 1319.
Figures of Speech, 997, 1770; rhetoric, 2406.
Fiji Islands, 997, 1189.
Filament, 1020.
File, 998, 2540.
Filefish, 998.
Filibuster, 998. Filefish, 998.
Filibuster, 998.
Filipinos, 41, 1364, 2191.
Filippo, Fra, 1600.
Fillmore, Millard, 998, 2976.
Filtration, 999, 2713.
Finch, 999, 1161.
Finck, Henry Theophilus, 999.
Findlay, Ohio, 999, 2024.
Fine Arts: art, 154; architecture, 132; sculpture, 2568.
Fingal's Cave. 999, 513 Fingal's Cave, 999, 513. Fingers, 1246. Finiguerra, Maso, 923. Finisterre, Cape, 466, 470.

Finland, 999, 1282, 2545.
Finland, Gulf of, 1000, 2467.
Finney, Charles Grandison, 1000.
Finns, 941, 1000.
Fins, 1000, 1004.
Finsen, Niels Ryberg, 1001.
Fiord, or Fjord, 1001, 1997.
Fir, 1001, 1467; Norway, 2717; Scotch, 2946.
Firdausi, or Firdusi, Abdul, 1001, 1764, 2165.
Fire, 1001; smoke, 2661.
Fire Alarm, 1002. Fire Alarm, 1002. Fire Alarm, 1002. Fireball. See Meteors, 1767. Fire Clay, 1002, 370, 596, 609. Firecrackers. See Fireworks, 1004. Fire Damp, 1002, 572, 747. Fire Department, 1002. Fire Engine, 1002. Fire Escape, 1003. Fire Extinguishers, 100 Firefly, 1003, 263, 1152. 1003. Fireproofing, 1003.
Fireworks, 1004, 2340.
Fire Worship. See Parses, 2114.
Firth, Clyde, 608; Forth, 1035; Solway, 2674; Tay, 2827. Tay, 2827.
Fischart, Johann, 1129.
Fischer, Ernst Kuno, 1004.
Fish, 1004, 123, 1000, 1197, 1229, 1236, 1295, 1536, 1537, 1597, 2156, 2213, 2505, 2600, 2605, 2778, 2796, 2897, 2924; ichthyology, 1359.
Fish, Hamilton, 1005, 3097.
Fish, Stuyvesant, 1005.
Fish Culture, 1005, 1359.
Fish Guano, 1211.
Fisher, Fort, 2279. Fisher, Fort, 2279. Fisher, George Park, 1006. Fisher, George Park, 1006.
Fisher's Hill, 2612.
Fishery, 1006; cod, 616; corals, 672; herring, 1295; menhaden, 1757; oysters, 2074; pearls, 2133; salmon, 2506; sardines, 2529; sponges, 2713; seal, 2574; trout, 2924; whale, 3132.
Fish Hawk, 1006.
Fish Market, 292.
Fishworm, 858 Fishworm, 858. Fishworm, 636.
Fisk, Clinton Bowen, 1007.
Fiske, John, 1007, 88, 1604.
Fiske, Minnie Maddern, 1007.
Fisk University, 1007, 1899.
Fission, Reproduction by, 2322; foraminifera, 1029; infusoria, 1387. Fitch, John, 1007. Fitch, William Clyde, 1008. Fitchburg, Mass., 1008, 1729. Fitchett, William Henry, 1008. Fitzgerald, Edward, 1008. Fitzgerald, Edward, 1008.
Fitzroy, Robert, 2771.
Fitzsimons, Thomas, 2989.
Fiume, Hungary, 1008.
Fiumicino, Italy, 2441.
Five Forks, 1008, 2210.
Five Nations. See Iroquois, 1412.
Fixed Stars. See Stars, 2728.
Flag, 1008; Canada, 451; Confederate, 649;
Cuba, 721; signals, 2632.
Flagellants, 1009.
Flageolet, 1010.
Flagg, Ernest, 673. Flagg, Ernest, 673. Flag Officer, 1010; flagship, 1010. Flag of Truce, 1010. Flagstone, or Flag, 1010. Flail, 2871.

Flamboyant, 1010. Flamboyant, 1010.
Flame, Temperature of, 1010; fire, 1002.
Flamingo, 1010, 1294.
Flaminian Way, 1010.
Flaminius, 271, 1010.
Flammarion, Camille, 1011.
Flanders, 1011, 266, 1051.
Flanders, Count of, 156.
Flandrin, Jean Hippolyte, 1011.
Flannel, 1011, 3181.
Flatbows, 1519 Flannel, 1011, 3181.
Flatbows, 1519.
Flatfish, 1011, 1236, 2645, 2937.
Flathead Indians, 1012, 1485, 2642.
Flathead Lake, 1834.
Flaubert, Gustave, 1048.
Flax, 1012, 1599, 2081.
Flaxman, John, 1012, 2570.
Flaxseed Oil, 1012, 1599.
Flea, 1012, 1394; jigger, 1458.
Fleabane, 1013.
Fleming, Sir Sanford, 1013.
Flemish, 1013, 266, 2236.
Flensburg, Germany, 1013, 2325. Fleming, Sir Sanford, 1013.
Flemish, 1013, 266, 2236.
Flensburg, Germany, 1013, 2325.
Fletcher, H. W., 197.
Fletcher, John, 255, 826.
Fleur-de-lis. See Iris, 1409.
Fleury, André Hercule de, 1013.
Flicker, 1013; woodpecker, 3179.
Flickertail, 1208.
Flickertail State, 1992.
Flinders Island, 244, 1080.
Flint, 1014, 154, 1733.
Flint, Mich., 1014, 1780.
Flint Austin, 1014.
Flint Glass. See Glass, 1149.
Flint Implements, 1014, 154.
Flint Implements, 1014, 154.
Flint River, 1014, 542.
Floating Islands, 1014, 2233.
Flodden, Battle of, 1015, 2564.
Flood, 779, 790, 1981.
Flood Henry, 1407.
Flood Plain, 1015; levee, 1576, 1807.
Flora (goddess), 1015.
Flora (botany), 346; plants, 2232.
Florence, Ala., 1015.
Florence, Italy, 1015, 2539.
Floriculture, 1016, 1020, 1325; landscape gardening, 1538.
Floricula, 1016, 2978. dening, 1538.
Florida, 1016, 2978.
Florida, Bay of, 1018.
Florida Keys, 1018, 1016.
Florida Straits, 1776. Florin, 1018. Flotow, Friedrich, Freiherr von, 1018. Flotow, Friedrich, Freiherr von, 10 Flotsam, 1018. Flounder, 1019, 1012. Flour, 1019, 365, 3133. Flourens, Léopold Emile, 1019. Flower, 1020, 2232; artificial, 1021. Flower, Roswell Pettibone, 1020. Flower, Roswell Pettibone, 1020, Flowers (chemistry), 2765. Flowers, Adoption of, 1020. Flowers, Artificial, 1021. Flowers, Language of, 1021. Floyd, John Buchanan, 1021. Floyd, William, 2995. Flügel, Otto, 1021. Fluids, 1022; fluid extracts, 961. Flukes, 2104. Flukeworm, or Fluke, 1022. Flukeworm, or Fluke, 1022. Fluorescence, 1022.

Fluorine, 1022, 547. Fluoroscope, 1022, 3197. Fluor Spar, 1022, 434, 1794. Fluor Spar, 1022, 434, 1794.
Flute, 1022.
Flux, 1022, 3118; borax, 339; solder, 2674.
Fly, 1022; Spanish, 263; insects, 1393; ichneumon fly, 1353.
Flycatcher, 1023, 1509, 3108.
Flying Dutchman, 3069.
Flying Fish, 1023, 1221, 2537.
Flying Fish, 1023, 212, 2537.
Flying Machine, 1023, 217, 1591.
Flying Squirrel, 1024, 2720.
Fly River, 1940.
Foci, 906; focus, 1503.
Focus. See Telescope, 2838.
Fodder, 1269, 924, 1570.
Fog. 1024, 606, 2368.
Fogazzaro, Antonio, 1025. Fodder, 1269, 924, 1570.
Fog, 1024, 606, 2368.
Fogazzaro, Antonio, 1025.
Fog Signals, 1025, 2633.
Foley, John Henry, 1025, 2570.
Folger, Charles James, 1025, 601.
Folk, Joseph Wingate, 1025.
Folklore, 1026, 969, 1607.
Folsom, Frances, 602.
Fon du Lac, Wis., 1026, 3169.
Fonseca, Manuelo Deodoro da, 1026, 2141.
Fonseca Benevides, Francisco da, 1026.
Fontaine, Jean de la, 3255.
Fontaine, Jean de la, 3255.
Fontainebleau, France, 1026, 1896, 2228.
Fontenelle, Bernard, 1048, 3254.
Fontenoy, Belgium, 1026, 2542.
Fonville, Wilfrid de, 1027.
Food, 1027, 365, 545, 1787, 2009, 2297.
Food, for plants, 2232.
Fools, Feast of, 1028.
Foot (measurement), 1028.
Foot (measurement), 1028.
Foot (measurement), 1028.
Foot and Mouth Disease, 1028.
Football, 1028, 176, 1093.
Foote, Anthur, 1029.
Foote, Arthur, 1029.
Forage, 1029, 65.
Foraker, Joseph Benson, 1029.
Foraker, Joseph Benson, 1029.
Foraminifera, 1029, 2006, 2322.
Forbes, Archibald, 1030.
Forbes, Sir John, 1030.
Force, 1030, 2103; energy, 915.
Force, Peter, 1030.
Force Pump, 2334.
Ford, Paul Leicester, 1031. Force Bill, 1031.
Force Pump, 2334.
Ford, Paul Leicester, 1031.
Forest, 1031; Arbor Day, 129; lumber, 1644.
Foresters, Ancient Order of, 1032, 274.
Foresters, Ancient Order of, of America, 274.
Foresters, Independent Order of, 1032, 274.
Foresters of America, 1032.
Forestry, 1033, 129, 1325.
Forger, 1033; hammer, 1243.
Forgery, 1033, 2215.
Forget-me-not, 1033, 1021.
Forks, 732, 1124.
Forlorn Hope, 1034, 3063.
Formaldehyde, 1034, 114.
Formentera, 215. Formentera, 215. Formic Acid, 1034. Formosa, or Taiwan Island, 1034, 1438. Foro Externo, 9. Forrest, Edwin, 1034, 1668. Forrest, Sir John, 1034.

Forrest, Nathan Bedford, 1034, 1037.
Forster, Johann Reinhold, 1035.
Forster, John, 1035.
Fort Clinton, 604.
Fort Dearborn. See Dearborn, Fort, 766.
Fort-de-France, Martinique, 1719.
Fort Dodge, Iowa, 1035, 1403, 3041.
Fort Donelson, 816.
Fort Duquesne. See Pittsburg, 2225.
Forte, 12 Fort Duquesie. See Tribbons, 12.
Forte, 12.
Fort Erie. See Erie, Fort, 932.
Fort Fisher, N. C., 1035, 2279.
Forth, Firth and River, Scotland, 1035, 1566.
Forts Henry and Donelson, 1035, 816.
Fortification, 1035, 2343, 2372. Fort Jefferson, 835. Fort Laramie, 3193. Fort Leavenworth, 1557. Fort Madison, Iowa, 1037. Fort Meigs, 2024. Fort Mims, Massacre of, 1037. Fort Monroe, or Fortress Monroe, 10 Fort Moultrie, 1037, 1444. Fort Niagara, 1037, 1968. Fort Pickens, 1037, 2153. Fort Pillow, 1037. Fort Scott, Kans., 1037, 1490. Fort Smith, Ark., 1038, 145. Fort Stanwix, 1038, 152, 2054, 2440. Fort Sumter, 1038, 255. Fortuna, 1038. Fortunate Islands 460 Fort Monroe, or Fortress Monroe, 1037, 1245. Fort Sumter, 1038, 255.
Fortuna, 1038.
Fortunate Islands, 460.
Fortune Telling, 805, 2088.
Fortuny y Carbo, Mariano, 1038.
Fort Wayne, Ind., 1038, 1380.
Fort Worth, Tex., 1039, 2853.
Forum, 1039, 1436.
Fossils, 1039, 1114, 1360.
Foster, Charles, 1039, 1040.
Foster, George Eulas, 1039.
Foster, John Watson, 1040.
Foster, Murphy James, 1040.
Foster, Randolph Sinks, 1040.
Foster, Stephen Collins, 1040.
Fostoria, Ohio, 1040.
Fouchel, Joseph, 1040.
Fouche, Joseph, 1040.
Fouche, Joseph, 1040.
Founding Hospital, 1041; hospital, 1326.
Foundry, 1041; blast furnace, 310, 1410.
Foundrin, 1041, 2269.
Fountain, 1041, 2268.
Fouqué, Freiderich Karl, 1041.
Fouquet, Nicolas, 1041.
Fouquet, Nicolas, 1042.
Fourier, François, 1042, 2668. Fouquet, Nicolas, 1041.
Four Corners, Ontario, 1042.
Fourier, François, 1042, 2668.
Four-O'clock, 1042.
Fowl, 1042, 1208, 2297.
Fowler, Charles Henry, 1042.
Fox, 1042; fennec, 986; Reynard the Fox, 2404.
Fox, Charles James, 1043, 1117, 1263.
Fox, George, 1043, 2344.
Fox, John D., 2711.
Fox Bat, 1043; bat, 244.
Fox Channel, 1332.
Foxglove, 1044, 1021.
Foxhound, 1044, 1328.
Fox Indians, 1044, 2482.
Fox Rivers, 1043.
Fox Sparrow, 1044, 2700. Fox Sparrow, 1044, 2700. Foxtail Grass, 1044, 1789, 3115. Fox Terrier, 1044, 2848.

Foyle River, 1044; Lough Foyle, 1405. Fra Angelico, 401. Fraction, 1044, 141. Fra Diavolo, 1044. Fra Filippo, 1600. Framingham, Mass., 1044. Franc, 1044, 1826. Franc, 1044, 1826.
France, 1045; army, 150; bank, 226; colonies, 629, 613, 1214, 1719, 1936, 2586, 2767, 2880; debt, 767; dynasties, 1049; education, 1047; literature, 1048; Austrian succession, 1117, 1707; Napoleon, 1894, 187, 1110, 1472, 2491; national emblem, 1020; Spanish succession, 196, 1131, 2628; universities, 1047, 2997.
France, Anatole, 1050.
France, Isle of, 1738.
Franchise, 1050, 888; municipal ownership, 1871.
Francia, Francesco, 1050.
Francis I., of France, 1051, 536, 1287, 1839.
Francis II., of France, 1051, 1723.
Francis II., of Germany, 1051, 1707.
Francis II., of Germany, 1051, 196, 1131, 1339.
Francis, David Rowland, 1051.
Francis, Saint, 1052, 169, 106, 529 Francis, Saint, 1052, 169. Francis Ferdinand, 1052, 168, 196, 538. Francis Ferdinand, 1052, 168, 196, 538.
Francis Joseph 1., 1052, 196, 1340.
Francis Mountains, 1052.
Francis Xavier. See XAVIER, 3194.
Franciscans, 169, 1052, 1390, 1756, 1824.
France, August Hermann, 1052, 874.
Franco-German War, 1053, 951, 1131, 3152.
Francois, Kurt von, 1053; Francolin, 1053.
Frankfort, Ind., 1054.
Frankfort, Ky., 1054, 1502.
Frankfort-on-the-Main, Germany, 1054, 1128.
Frankfort-on-the-Oder, Germany, 1054.
Frankfortense, 1054; incense, 1372. Frankincense, 1054; incense, 1372. Franking Privilege, 1055; post office, 2290. Franklin, or Frankland, 1055, 2844. Franklin, Canada, 1055, 458. Franklin, Ind., 1055. Franklin, Mass., 1055. Franklin, Mass., 1055.
Franklin, N. H., 1055.
Franklin, Pa., 1055.
Franklin, Battle of, 1055, 2552.
Franklin, Benjamin, 1056, 85, 2989, 2992, 2995.
Franklin, Sir John, 1056, 1657, 2248.
Franklin, William Buel, 1057.
Franklin and Marshall College, 1537.
Franks, 1057, 1049, 1130.
Franz Joseph Land, 1057, 2249.
Fraser River, 1057, 376.
Fraternal Societies, 273.
Fraternities, 1057, 2181.
Fraud, 1057, 705, 1033.
Fraunhofer, Joseph von, 1058.
Fraunhofer's Lines, 1058.
Fréchette, Louis Honoré, 1058. Fraunhofer's Lines, 1058.
Fréchette, Louis Honoré, 1058.
Fréderic, Harold, 1058, 1723.
Frederick, Md., 1058, 1723.
Frederick I. (Barbarossa), 1058, 717, 1131.
Frederick II., of Prussia, 1059, 1131, 1707, 2595.
Frederick III., of Prussia, 1059, 1131, 1707, 2595.
Frederick III., of Germany, 1059, 1132.
Frederick II., of Sicily, 1059.
Frederick VIII., of Denmark, 1060, 784.
Frederick Augustus I., 2543.
Frederick Charles Nicholas, 1060, 1567.
Fredericksburg, Va., 1060.
Fredericksburg, Battle of, 1060, 1561.
Frederick William, of Brandenburg, 1060.

Frederick William, of Germany, 3153. Frederick William I., of Prussia, 1060. Frederick William II., of Prussia, 1061. Frederick William III., of Prussia, 1061, 540, Frederick William IV., of Prussia, 1061, 1131. Frederick William IV., of Prussia, 1061, 1 Frederickton, Canada, 1061, 1935. Frederikshald, Siege of, 538. Fredonia, N. Y., 1061. Free Church, 1061, 527. Free Cities, 1061, 588. Freedmen's Bureau, 1062, 1007, 2399. Freeland, Pa., 1062. Free Lovers, 2157. Freeman, Edward Augustus, 1062, 920. Freeman, Iames, 1062. Freeman, Edward Augustus, 1062, 920. Freeman, James, 1062. Freeman, Mary Eleanor Wilkins, 1062. Freemason, 1062, 2257. Free Methodists, 1063, 1769. Freeport, Ill., 1063, 1367. Freeport Heresy, 1063. Free Ports, 1063, 1061. Free-Soil Party, 1063, 1235, 2259, 3016. Freestone, 2667; talc, 2809. Freethinkers, 1063. Freetown, Sierra Leone, 1063, 2631. Free Trade, 1063, 2321, 2819. Free Will, 1064. Free Will, 1004. Freewill Baptists, 1064. Freezing, 1064, 1357, 2390, 2861. Freiberg, Germany, 1065. Freiburg, Germany, 1065. Freight, 1065, 293, 491, 640. Freiligrath, Ferdinand, 1065. Frelinghuysen, Frederick, 1065. Frelinghuysen, Frederick Theodore, 1065. Freinghuysen, Frederick Theodore, 1065.
Fremont, Nebr., 1066, 1914.
Fremont, Ohio, 1065.
Frémont, John Charles, 1066, 1114, 2399.
Fremont's Peak, 2434.
French, Alice, 1066.
French, Daniel Chester, 1066, 2570.
French, Sir John Denton Pinkstone, 1066.
French Academy, 11.
French and Indian Wars, 1067, 1037, 2070. French and Indian Wars, 1067, 1037, 2979. French Bean, 1067; bean, 252. French Broad River, 1067, 161. French Chalk, 2809. French Chalk, 2809.
French Congo, 1068, 33, 1047.
French Guiana. See Guiana, 1214.
French Guinea, 1068, 33, 1047.
French Indo China. See Indo China, 1384.
French Language. See France, 1047.
French Opera, 2041.
French Revolution, 1068, 641.
French Somaliland, 1069, 33, 1047.
French Sudan, 33, 2767.
Frenchtown, Mich., 1070.
French West Africa. 1070. Frenchtown, Mich., 1070.
French West Africa, 1070.
French West Africa, 1070.
Freneau, Philip, 1070, 86.
Frere, Sir Henry Bartle Edward, 1070.
Frère, Pierre Eduard, 1070.
Fresco, 1070, 2080, 2212.
Fresnel, Augustin Jean, 1070.
Fresno, Cal., 1070, 440.
Frew, William H., 486.
Frey, or Freyr, 1071.
Freya, or Freyia, 1071, 3116. Frey, or Freyr, 10/1. Freya, or Freyja, 1071, 3116. Freycinet, Charles Louis, 1071. Freytag, Gustav, 1071, 826, 1130, 2004. Friar, 1071, 485, 1756. Friction, 1071, 1275. Friday, 1071; Black, 305; Good, 1164.

Friedland, Duke of, 3075.
Friendly Islands, or Tonga Islands, 1071.
Friends, Society of. See Quakers, 2344.
Friesland, 334, 1072.
Frigate, 1072.
Frigate Bird, 1072.
Frigga, or Frigg, 1072, 2019, 2868.
Frisians, 1072, 1927.
Frith, William Howell, 1072.
Frobisher, Sir Martin, 1072, 1113.
Frobisher Bay, 1072.
Froebel, Frederick, 1072, 682, 1507, 2554.
Frog, 1073, 402, 2886.
Frohman, Charles, 1074. Frohman, Charles, 1074. Froissart, Jean, 1074, 1048. Fronde, 1074. Fronde, War of, 1074, 647, 2937. Fronde, War of, 1074, 647, 2937.
Frontenac, Louis de Buade, 1074, 1468.
Frost, 1074; frostbite, 1074.
Frostburg, Md., 1075.
Froude, James Anthony, 1075, 920, 3235.
Fruit, 1075, 1325, 2580.
Fry, whitefish, 1006.
Fry, Elizabeth Gurney, 1075.
Frye, William Pierce, 1075.
Frye, William Pierce, 1075.
Fuca, Juan de, 1075, 1122, 2332.
Fu-chow. See Fоосноw, 1027.
Fuchs. Leonhard, 1076. Fuchs, Leonhard, 1076. Fuchsia, 1076.
Fuchsia, 1076.
Fuego, Mount, 1211.
Fuego, Tierra del, 2877.
Fuel, 1076, 609, 620, 1032, 1100.
Fugitive Slave Law, 1076.
Fujiyama, or Fujiu-San, 1077, 1438. Fujiyama, or Fuju-San, 1077, 1438. Fulah, 1077, 2880. Fulcrum, or Prop, 1577. Fuller, Melville Weston, 1077, 352. Fuller, Sarah Margaret, 1077, 1606. Fuller, Thomas, 1077, 3248, 3250. Fuller's Earth, 1077. Fulmar, 1077, 2607; petrel, 2176. Fulmination, 1078. Fulton, N. Y., 1078. Fulton, Robert, 1078, 1008, 2732. Fulvia, 115. Funchal, Madeira, 1078, 1670. Funchal, Madeira, 1078, 1670. Function, 1078. Function, 1078.
Fundy, Bay of, 1078, 954.
Fungi, 1078, 803, 1785, 1878, 2931.
Funston, Frederick, 1079, 41, 2982.
Fur, 1079, 993.
Furies, 1079, 2052, 2057.
Furlong, 1079, 1744.
Furnace, 1080, 43, 310.
Furnacy, Islands, 1080 Furneaux Islands, 1080. Furness, Horace Howard, 1080. Furnivall, Frederick James, 1080. Fur Seal, or Sea Bear. See SEAL, 2578. Furth, Bavaria, 1080. Fusan, or Pusan, Corea, 1080, 675. Fuse, or Fuze, 1080, 311, 1796. Fusel Oil, 1081. Fusing Point, 1081, 1064. Fusiyama. See Fujiyama, 1077. Fyles, Franklin, 265.

G

G, 1082, 1879, 2951. Gabelle, 1082. Gable, 1082; roof, 2446. Gabriel, 1082; archangel, 131.

Gabun, or Gaboon, 1082, 1068. Gad, 1082, 1441, 1455. Gade, Nils Wilhelm, 1082. Gade, Nils Wilhelm, 1082. Gadfly, or Horsefly, 1083. Gadsden, Ala., 1083. Gadsden, James, 1083. Gadsden Purchase, 1083, 2932, 2982. Gadski, Johanna, 1083. Gadwall, or Gray Duck, 1083, 3145. Gaea, 1354, 2883, 3000. Gael, or Gail, 1083; Celts, 518. Gaelic Dialect, 2563, 2649. Gaeta, Italy, 1083. Gage, Lyman Iudson, 1083, 486, 3189. Gaeta, Italy, 1083.
Gage, Lyman Judson, 1083, 486, 3183.
Gage, Lyman Judson, 1083, 486, 3183.
Gage, Thomas (1721-1787), 405.
Gagnon, Ernest, 456; Gag Rule, 1084.
Gail Hamilton, 809, 2327.
Gaines's Mill, Battle of, 1084, 1430.
Gainesville, Florida, 1084, 1017.
Gainesville, Tex., 1084.
Gainsborough, Thomas, 1084.
Gairdner, James, 1084.
Gaius, or Caius, 1084.
Galactometer, 1529.
Galactometer, 1529.
Galatea, 1085; Grotto of, 15.
Galatia, 1085, 2125.
Galatians, Epistle to the, 1085, 2126. Galatians, Epistle to the, 1085, 2126. Galatz, or Galacz, Rumania, 1085. Galaxy, 1788.
Galaxy, 1788.
Galba, Servius Sulpicius, 1085, 1922.
Galen, Claudius, 1085, 586, 910, 3058.
Galena, or Lead Glance, 1085. Galena, Ill., 1086. Galena, Kans., 1086. Galerius, 659. Galerius, 659.
Galesburg, Ill., 1086, 1367.
Galicia, Austria, 1086, 195.
Galilee, 1086, 1453.
Galilee, Sea of, 1086, 2084.
Galileo, or Galilei, 1087, 173, 973, 2839.
Galion, Ohio, 1087.
Gall, Franz Joseph, 1087, 2204.
Gallait. Louis. 1088. Gallait, Louis, 1088. Galland, Antony, 126. Galland, Antony, 126.
Galland, Antony, 126.
Gallas, or Oroma, 1088, 10, 914, 1242.
Gallatin, Albert, 1088, 1136.
Gallaudet, Edward Miner, 1088.
Gall Bladder, 1088, 292, 1609.
Galleasses, 1089.
Galley, 1088, 2921, 3002.
Gall Fly, 1089, 2012.
Gallia, or Gaul, 1104.
Gallinger, Jacob H., 1089.
Gallipoli, Turkey, 1089.
Gallipolis, Ohio, 1089.
Gallium, 1089, 547.
Gallon, 1089.
Galls, or Gallnuts, 1089, 1389, 2012, 266. Gallon, 1089.
Gallon, 1089, 1389, 1389, 2012, 2670.
Gallstones. See Bile. 292.
Galt, Ontario, 1089, 2040.
Galt, John, 456, 1090, 2563.
Galt, Sir Alexander Tilloch, 1090.
Galton, Francis, 1090.
Galvani, Luigi, 1090, 329, 892.
Galvanic Battery, 1090, 892.
Galvanism 1091 Galvanic Battery, 1090, 892. Galvanism, 1091. Galvanized Iron, 1091, 3220. Galvanometer, 1091, 897, 2860. Galveston, Tex., 1091, 2853. Galveston Bay, 1091, 2851. Galway, Ireland, 1092.

Galway Bay, 1092, 1405.
Gama, Vasco da, 1092, 1901, 2288.
Gambetta, Leon, 1092, 218.
Gambia, 1092, 2586.
Gambia River, 1092.
Gambling, 1093, 1629.
Gamboge, 1093, 2811.
Game, 1093, 770.
Game Preserves, 1093.
Games, 1093, 633, 1224; backgammon, 206; bagatelle, 210; baseball, 240; basket ball, 242; billiards, 293; cards, 481; cassino, 499; cribbage, 703; croquet, 712; dominoes, 815; écarté, 863; euchre, 944; football, 1028; gambling, 1093; lacrosse, 1529; lawn tennis, 1552; marble, 1704; Nemean, 1920; Olympic, 2034; pool, 2270; Pythian, 2341; quoits, 2357; roulette, 2455; solitaire, 2672; war game, 3082; whist, 3138. 3138, Gander River, 1938. Ganges River, 1093, 779, 1374. Ganges Canal, 1094. Ganglion, 1094. Gangrene, or Mortification, 1094, 224, 1298. Gannet, 1094. Gannet, 1094.
Ganoids, 1095, 1865.
Gansevoort, Peter, 1094.
Ganymede, 1094; satellite, 1479.
Gapes, 1094; gape worm, 1094.
Gar, or Pike, 1095, 334.
Garbage, 1095; sewerage, 2598.
Garcés, Francisco, 1931.
Garcia, Manuel, 1095.
Garcia Iniguez, Calixto, 1095, 1163.
Garcilaso de la Vega, 1095.
Garda, Lake, 1095, 1419.
Garden City, N. Y., 1096.
Garden City, The, 1954.
Garden of the Gods, 1096, 632, 1697.
Gardiner, Me., 1096.
Gardiner, Mont., 3205.
Gardiner, Samuel Rawson, 1096.
Gardiner, Mass., 1096.
Gardiner, Mass., 1096.
Garfield, N. J., 1096.
Garfield, James Abram, 1096, 1217, 2976.
Gargarus, Mount, 1360.
Gargarus, Mount, 1360.
Gargarus, Mount, 1360.
Gargarus, Mount, 1360.
Gargarus, Mount, 1360. Ganoids, 1095, 1865. Gargarus, Mount, 1360. Garibaldi, Giuseppe, 1097, 1423, 2628, 3043. Garland, Augustus Hill, 1097. Garland, Hamlin, 1098. Garlic, 1098, 2037. Garland, 17amin, 1098.
Garlic, 1098, 2037.
Garneau, François Xavier, 456.
Garnerin, M., 217.
Garnet, 1098, 2750; carbuncle, 481.
Garnet, Henry Highland, 1098.
Garnishment, 1098; attachment, 180.
Gar Pike, 335, 1095.
Garrone River, 1098, 1045.
Garrett, John Work, 1099.
Garrick, David, 1099.
Garrick, David, 1099.
Garrick, 1099.
Garrick, 1099.
Garter, Order of the, 1099, 1118, 1515.
Garter Snake, 1100.
Gary, James Albert, 1100, 2656.
Gas, 1100; acetylene, 13; eudiometer, 944; natural gas, 1904.
Gasconade, 1101.
Gascons, 535, 2437.
Gascony, or Gascogne, 1101.
Gas Engine, 1101, 14.

Gaskell, Elizabeth Cleghorn, 1102. Gasoline, 1101, 1892, 2754.
Gasoline, 1101, 1892, 2754.
Gasparo Aselli, 1529.
Gastric Juice, 1102, 2208, 2748.
Gastritis, 1102, 2749.
Gastropoda, 1102, 1593, 2663. Gates, Horatio, 1103, 408, 2528. Gates, Sir Thomas, 1103. Gath, Philistia, 1103, 2192. Gatineau River, 1103, 2192.
Gatineau River, 1103.
Gatling, Richard Jordan, 1103.
Gatling Gun, 1103, 464, 1219.
Gatschet, Albert Samuel, 1103.
Gauchos, 1104.
Gaude, 252.
Gauge, or Gage, 1104, 225. Gaude, 202. Gauge, or Gage, 1104, 325. Gaul, or Gallia, 1104, 1085. Gauls, 920, 1049. Gaunt, John of, 1462, 543, 1594. Gaur, or Gour, 1104. Gauss, Karl Friedrich, 1618. Gautama, 395. Gautier, Theophile, 1104, 1048. Gavarni, 1104. Gavarni, 1104.
Gavazzi, Alessandro, 1105.
Gaveston, Piers de, 877.
Gavial, or Gharial, 1105, 708.
Gay, John, 1105.
Gay, Sidney Howard, 1105, 3244.
Gay-Lussac, Louis Joseph, 1105, 217.
Gaza, Syria, 1105, 740, 2192.
Gazelle, 1106, 2716.
Gear, John Henry, 1106, 813.
Gearing, 1106; wheel, 3134.
Geary, John White, 1106.
Geary Law, 569.
Geber, Abu-Musa, 1106.
Gebhardt, Eduard von, 1106.
Gecko, 1107, 1612.
Ged, William, 2741.
Geddes, Patrick, 1107. Geddes, Patrick, 1107 Geelong, Australia, 3045. Gehenna, 1107, 1281. Geibel, Emmanuel, 1107. Geijer, Eric Gustaf, 1107, 2787. Geijer, Eric Gustaf, 1107, 2787.
Geikie, Sir Archibald, 1107.
Geissler, Heinrich, 1107, 711.
Geissler's Tubes, 711, 1107.
Gelée, Claude. See CLAUDE LORRAINE, 595.
Gellert, Christian Fürchtegott, 965.
Gelon, 1299.
Gelsenkirchen, Germany, 1107.
Gem, 1108, 793, 2750.
Gemini, the Twins, 1108, 3223.
Gemmation, Reproduction by, 2322.
Gem of the Mountains State, 1360.
Gemsbok, 1108; antelope, 110.
Gendarmes, 1108. Gendarmes, 1108. General (military), 2394; major, 2394. Generalization, 1108. Generator (electric), 850. Genesee River, 1108, 1956. Genesis, 1108, 2154. Genet, 1108.
Genet, or Genest, Edmond Charles, 1109.
Geneva, Ontario, 1109. Geneva, Switzerland, 1109; treaty of, 2385. Geneva Arbitration. See Alabama Claims, 47. Geneva Award, 47, 2414. Geneva Convention. See RED CROSS SOCIETY, 2385 Geneva Lake, or Lake Leman, 1109, 2793.

Genghis Khan, 1110, 705, 1827, 2471. Genii, 1110. Gennis 1110.
Gennesaret. See Galilee, Sea of, 1086.
Genoa, Italy, 1110, 1421.
Genseric, 1111, 2444, 3018.
Gensfleisch, Johann, 686, 1223.
Gentian, 1111, 2894.
Gentile, 1111, 1155
Genus, 1111; species, 2702.
Geoffrey of Monmouth, 1111, 919.
Geographical Distribution, 1111; animal Geoffrey of Monmouth, 1111, 919.
Geographical Distribution, 1111; animal, 104.
Geographical Societies, 1112.
Geography, 1112; longitude, 1626; map, 1702; scason, 2575; physiography, 2206; zone, 3224.
Geological Survey, 1114; surveying, 2782.
Geology, 1114, 34, 1135, 1145.
Geometry, 1116, 735, 906, 944, 2315.
George L. of Greece, 1116, 1196. Geometry, 1116, 735, 906, 944, 2315.
George I., of Greece, 1116, 1196.
George I., of England, 1116, 1711, 3076.
George II., of England, 1116, 922.
George III., of England, 1117, 1985, 2224.
George IV., of England, 1117, 922, 3152.
George V., of England, 1117, 922, 1190, 2312.
George V.II., of Georgia, 1121.
George, Czerny, 2593; George, Fort, 1117.
George, Henry, 1117, 1465, 2641.
George, David Lloyd, 1117, 167.
George, Lake, 1117, 1956.
George, Saint, 1117; George, William, 1118.
George Junior Republic, 1118.
George's Channel, Saint, 1405. George Junior Republic, 1118.
George's Channel, Saint, 1405.
Georgetown, British Guiana, 1118, 1214.
Georgetown, D. C., 805, 1118.
Georgetown, S. C., 1118.
Georgetown University, 1118.
George Washington University, 1118.
George Washington University, 1118.
Georgia, 1119, 1021, 2021, 2978.
Georgia, 1121; Georgians, 1121, 1252.
Georgia, Strait of, 1121, 376, 3016.
Georgia, University of, 1122.
Georgian Bay, 1122, 1343.
Georgian Gulf, 1057; Gera, Germany, 1122.
Geranium, 1122, 1021, 2542.
Gerard, Baron François Pascal, 1122.
Gerard, James Watson, 1122.
Gerhard (Desiderius Erasmus), 930.
Gerhardt, Carl Friederich, 1122, 3251.
Gerhardt, Paul, 1122, 1129, 1353.
Germania, Henri, 1123.
Germania (statue), 633.
Germaniaus Caesar, 1123, 629.
Germaniaus Caesar, 1123, 9874 Germania (statue), 633. Germanicus Caesar, 1123, 2874. Germanium, 547. German Literature, 1129, 2236. German Oceanica, 1123. German Silver, 1124; alloy, 73. German Southwest Africa, 1124, 1053, 1127, 1889.
Germantown, Pa., 1124, 2182.
German Universities, 1124, 2997.
Germany, or German Empire, 1125, 950; Alsace-Lorraine, 76; Anglo-Saxons, 103; Austrian War, 1052, 1131, 2326; Baden, 208; bank, 226; Bavaria, 249; colonies, 629, 1127, 1280, 1940; Charlemagne, 534; education, 874, 1127; flag, 1009; Hanover, 1249; Hapsburg, House of, 1250; Hanseatic League, 1250; Hesse, 1296; Hohenzollern, 1311; Holstein, 783; national emblem, 1020; Peasants' War, 2134; Prussia, 2325; Reformation, 2388; Saxony, 2542; Seven

Years' War, 2595, 1059; Seven Weeks' War, 2595, 1131; Silesia, 2634; Swabia, 2783; universities, 1127, 2997; Westphalia, 3128; Württemberg, 3189. versities, 1127, 2997; Westphalia, 3128; Vemberg, 3189.
Germiation, 1132, 919.
Germs, 1133; bacteriology, 207.
Germ Theory of Disease, 1133, 803.
Gérome, Jean Léon, 1134.
Geronimo, 1134.
Geronimo, 1134.
Gerry, Elbridge, 1134, 2995.
Gerry, Elbridge T., 558.
Gerrymander, 1134, 83.
Gertrude of Wyoming, 449.
Gesner, Konrad von, 290, 2795.
Gessler, Count, 2839.
Gethsemane, 1134, 2033.
Gettysburg, Battle of, 1134, 1743.
Gettysburg Address, Lincoln's, 1596.
Geyser, 1135, 1358, 3204.
Ghats, or Ghauts, 1135.
Ghebers, or Guebres. See Parsees, 2114.
Ghent, Belgium, 1135, 266, 1011.
Ghent, Treaty of, 1136, 128, 1671, 2980.
Gherardi, Bancroft, 1136.
Ghezo, 741.
Ghibellines, 1015, 1213, 1423.
Ghiberti, Lorenzo, 1136, 2570.
Ghike, Helen, 817.
Ghrlandaio, Demenico Corradi, 1136.
Ghost Dance, 2385.
Giants, 1136, 1162, 1472, 1535, 1790.
Giants' Causeway, 1137, 239.
Gibbon, Edward, 1137, 920, 3239. Gibbon, 1137, 116. Gibbon, Edward, 1137, 920, 3239. Gibbon, John, 1138. Gibbon, John, 1138.
Gibbons, James, 1138, 509.
Gibcon, Palestine, 1138, 2803.
Gibraltar, Peninsula of, 1138.
Gibraltar, Spain, 1138, 1036.
Gibraltar, Strait of, 1138, 1749.
Gibson, Charles Dana, 1139.
Gibson, John, 1139, 2570.
Giddings, Franklin Henry, 1139.
Giddings, Joshua Reed, 1139.
Gideon, 1139, 1456, 1784.
Gifford, William, 1482.
Gila Monster, 1140. 1139. Gifford, William, 1482.
Gila Monster, 1140.
Gila River, 1140, 142.
Gilbert, Sir Humphrey, 1140, 457, 2371.
Gilbert, Sir John, 1140.
Gilbert, William, 892.
Gilbert, William Schwenck, 1140, 409, 2327.
Gilbert Islands, 1140, 2264.
Gilboa, Mount, 1140, 1456, 2192, 2536.
Gilding, 1140; electrotyping, 897.
Gilead, 1141, 1449.
Giles, William Branch, 1141.
Gill, Charles Ignace, 1141.
Gill, Theodore Nicholas, 1141.
Gillette, William Hooker, 1141. Gill, Theodore Nicholas, 1141. Gillette, William Hooker, 1141. Gillott, Joseph, 2145. Gills, 1141, 1004, 1073. Gilman, Arthur, 1142. Gilman, Daniel Coit, 1142, 486. Gilman, Nicholas, 2989. Gilmore, James Roberts, 1142. Gilmore, Patrick Sarsfield, 1142. Gilclo, or Jilolo, Island, 1142, 1823. Gin (liquor), 1142, 1478. Gin (mechanics), 1142. Ginger, 1142, 2707.

Gingham, 1142; calico, 437.
Ginnunga Gap, 761.
Ginseng, 1143, 2708.
Giordano, Luca, 1143.
Giorgione, or Great George, 1143, 2884.
Giotto, di Bondone, 1143, 581.
Giraffe, or Camelopard, 1143, 2462.
Giralda of Saville, 817.
Girard, Stephen, 1144.
Girard College, 1144, 2183.
Girard College, 1144, 2183.
Girardin, Emile de, 1144.
Girardin, François Auguste Saint-Marc, 1144.
Girdwood, Gilbert P., 1144.
Gironde River, 1098.
Girondists, 1144, 1109, 2437.
Gissing, George, 1145.
Giusto, Guiseppe, 1422.
Gizeh, Egypt, 547, 883, 2339.
Gizzard, 1145, 298; stomach, 2748.
Glace, Mer de, 1760, 76, 530.
Glace Bay, Cape Breton Island, 1145.
Glacial Period, 349, 1116, 1145.
Glacier de Bois, 530. Glacier de Bois, 530. Glaciers, 1145, 49, 1199, 1760. Gladden, Washington, 1146. Gladiator, 1146, 92; games, 1093. Gladiator, 1146, 92; games, 1093.
Gladiolus, 1147.
Gladsheim, 3072.
Gladstone, William Ewart, 1147, 920, 1408.
Glaisher, James, 218.
Glanders, 1148.
Glanders, 1148, 95, 2505.
Glasgow, Scotland, 1148, 2563.
Glasgow, University of, 1149, 1187, 2997.
Glass, 1149, 202, 2515.
Glass Painting, 42, 1150.
Glastonbury, England, 1150.
Glauber, J. R., 1150, 1804.
Glauber's Salt, 1150, 1804.
Glazing, 1150, 2296, 2848.
Glazunoff, Alexander, 1151.
Gleiwitz, Germany, 1151.
Gleiwitz, Germany, 1151.
Glen, The New York, 465.
Glencoe. Scotland, 1151.
Glendower, Owen, 1151, 3072. Glendower, Owen, 1151, 3072. Glenn, Dr. G. R., 649. Glens Falls, N. Y., 1151. Glenville, Ohio, 1151. Gleyre, Marc Charles Gibriel, 1151. Globe, 1151, 179, 1702. Glommen River, 1152, 1997. Gloria in Excelsis. 1524. Gloria in Excelsis, 1524. Gloria in Excelsis, 1524. Glottis, 1545; hiccough, 1298. Gloucester, England, 1152. Gloucester, Mass., 1152. Gloucester City, N. J., 1152. Glove, 1152, 1155. Gloversville, N. Y., 1152. Glowworm, 1152, 1003, 2200. Gloxinia, 1153. Gloxinia, 1153. Glucinum, 547 Glucinum, 547. Gluck, Christoph von, 1153, 283, 1879. Glucose, 1153, 2770. Glue, 1154, 1416, 3027. Gluten, or Vegetable Fibrine, 1154, 3133. Glutton, 1154. Glycerin, 1154, 2547. Glycerin, Nitro, 1980, 959. Glyptodon, 1154. Gnat, 1154, 1858. Gneisenau, August Anton von, 1155. Gneiss, 1155, 1323, 1767.

Gnomes, 969. Gnomes, 969.
Gnosticism, 1155, 1292, 3012.
Gnu, 1155, 32.
Goat, 1155, 103, 1355, 2433.
Goat Island, 1156, 1967, 1968, 3101.
Goatsucker, 1156, 1973, 3137.
Gobelin Tapestry, 1557, 2816.
Gobi, Desert of, 1156, 164, 563, 2369.
God, or Supreme Being, 1156, 287, 1 Gobi, Desert of, 1156, 164, 563, 2369.
God, or Supreme Being, 1156, 287, 1453, 2394.
Godard, Benjamin Louis, 1157.
Godavari River, 1157, 1374.
Goddard Seminary, 236.
Godfrey of Bouillon, 1157, 214, 716, 2813.
Godiva, Lady. See Coventry, 691.
Godkin, Edward Lawrence, 1157.
Godolphin, Sir Francis, 1253, 2359 Godolphin, Sir Francis, 1253, 2559. God Save the King, 1157. Godwin, 1157, 876, 1254; Godwin, Parke, 1158. Godwin-Austen, Mount, 1302. Goebel, William, 1158. Goebel, William, 1158.
Goessmann, Charles Arthur, 1158.
Goethals, George W., 1158.
Goethe, Johann von, 1158, 826, 1129, 2549, 3118.
Goetschius, Percy, 1159.
Gog and Magog, 1159, 112.
Gogebic Iron Range, 1410, 1283, 3167.
Gogol, Nikolai Vassilyevitch, 1159.
Gokscha, or Sevanga Lake, 1159.
Golconda, India, 1159.
Gold, 1159: Klondike, 1514, 50: Australia, 100. Golconda, India, 1159.
Gold, 1159; Klondike, 1514, 50; Australia, 190;
Black Hills, 305; California, 438; fusing point,
1081; Montana, 1834; Transvaal, 2911.
Gold Coast, 1160, 161, 1523.
Golden Age, 1160, 35.
Golden Bull. See BULL, 401.
Golden Calf, 501.
Golden Chain, Order of 274 Golden Chain, Order of, 274. Golden Cross, United Order of, 274. Golden Eagle, 852. Golden Fleece, 1160, 138, 1443, 2209.
Golden Fleece, 1161, 2518.
Golden House, 1161.
Golden Number, 734, 925, 1770.
Golden-Rod, 1161, 1021.
Goldfinch, 1161; finch, 999.
Goldfish, 1161; carp, 488.
Gold Lace, 1161, 1528.
Goldman, Emma, 1157, 95.
Goldoni, Carlo, 825, 1422.
Goldsboro, N. C., 1161.
Goldsborough, Louis Malesherbes, 1161.
Goldschmidt, Jenny Lind, 1596.
Goldschmidt, Jenny Lind, 1596.
Goldschmidt, Jenny Lind, 1596.
Gold Standard, 294, 727, 1825.
Gold State, 437.
Golf, 1162, 216.
Golgotha, 442, 1315, 1454, 3036.
Goliath, 1162, 758.
Gomez, José Miguel, 722.
Gomez, Maximo, 1162, 722.
Gompers, Samuel, 1163.
Gondar, Abyssinia, 10.
Gondola, 1163, 3029; barge, 230.
Gong, 1163; tambourine, 2812.
Goniometer, 1163, 1794.
Gonsalvo de Cordova, 1163.
Gonzaga Cameo, 447.
Goodall, Frederick, 1163.
Goode, George Brown, 1163.
Goode Fellows, Royal Society of, 274. Golden Fleece, 1160, 138, 1443, 2209. Golden Gate, 1161, 2518. Good Fellows, Royal Society of, 274.

Good Friday, 1164, 1311; fast, 979. Good Hope, Cape of, 29, 471. Goodrich, Samuel Griswold, 1164. Good Samaritan, The, 2101. Good Templars, Order of, 1164, 2901. Good Will, 1164. Goodwin, Nathaniel Carl, 1164. Goodwin, William L., 1164. Goodwin Sands, 1164. Goodwar Charles 1164 Goodwin Sands, 1164. Goodyear, Charles, 1164. Goose, 1164, 298, 458, 2297. Gooseberry, 1165, 284. Goosefoot. See Pigweed, 2213. Gopher, 1165, 1208; squirrel, 2719. Gopher State, 1799. Goramy, or Gourami, 1165. Gordian Knot, 1165, 62. Gordon, Anna, 3150. Gordon, Charles George, 1165, 912, 1505, 1591, 2909. Gordon, Charles William, 1166.
Gordon, John Brown, 1166, 384.
Gore, Catharine Grace, 1166.
Gore, Christopher, 1166.
Gore, Thomas Page, 1166.
Gorge, The, 1968; Toltec Gorge, 2892.
Gorges, Sir Ferdinando, 1681, 1942.
Görgey, Arthur, 1167. Gorges, Sir Ferdinando, 1681, 1942.
Görgey, Arthur, 1167.
Gorgons, 1167, 2162.
Gorham, Nathaniel, 2989.
Gorilla, 1167, 116.
Gorky, Maxim, 1167.
Görlitz, Germany, 1167.
Görnan, Arthur Pue, 1168.
Gorman, Arthur Pue, 1168.
Gorres, Jacob Joseph von, 1001.
Gortschakoff, Alexandra Michaelovitch, 1168.
Gorschen, George Joachim, 1168. Cortschakoff, Mikhail, 1168.
Goschen, George Joachim, 1168.
Goschen, George Joachim, 1168.
Goshawk, 1168, 1268.
Coshen, Egypt, 1168, 1455.
Goshen, Ind., 1168.
Gosnold, Bartholomew, 1168, 468.
Gospel, 1169; Gospels, 288.
Gossamer, 1169; Gospels, 2707.
Gosse, Edmund William, 1169.
Cosse, Philip Henry, 1169.
Gota River, 2786.
Gothard, Germany, 1169.
Gothard, or Gotthard, Saint, 1169.
Gothenburg. See Gottenburg, 1170.
Gothic Architecture, 1169, 133. Gothenburg. See Gottenburg, 1170.
Gothic Architecture, 1169, 133.
Gothic Language, 2956.
Gothic Version, 288.
Gothland, Island, 1169, 2785.
Goths, 1170, 48, 1130, 1340.
Gottenburg, or Gothenburg, Sweden, 1170, 2787.
Göttingen, Germany, 1170, 1125.
Göttingen, Germany, 1171, 2997.
Gottschalk, Louis Moreau, 1171, 2124.
Gottsched, Johann, 1129.
Goudimel, Claude, 1879.
Gough. John Bartholomew, 1171. Goudimel, Claude, 1879.
Gough, John Bartholomew, 1171.
Goujon, Jean, 1171, 2570.
Gould, Benjamin Apthorp, 1171.
Gould, George Jay, 1171.
Gould, Helen Miller, 1171.
Gould, Jay, 1172, 1171.
Gound, Charles François, 1172, 2041.
Gourd, 1172; melon, 1753; pumpkin, 2335.
Gout, 1172; kidney, 1506.
Govan, Scotland, 1172. Govan, Scotland, 1172.

Government, 1172; anarchy, 94; aristocracy, 140; autonomy, 197; communism, 642; democracy, 779; monarchy, 1824; republic, 2398; socialism, 2667; theocracy, 2858.
Government Land, 1173, 1398, 2302, 2782. Government Land, 1173, 1398, 3 Governor, 1173, 2734. Governor's Island, 1174, 1959. Governor's Island, Mass., 1174. Gowan, James Robert, 1174. Gower, John, 1174, 919. Gozzoli, Benozzo, 1174. Gozzoli, Benozzo, 1174. Gracchus, 1174, 2560. Grace, Days of, 1174. Graces, 1174; Thalia, 2854. Grady, Henry Woodfin, 1174 Grafting, 1175, 396, 1326. Grafton, Mass., 1175. Grafton, N. D., 1175. Grafton, W. Va., 1175. Graham, William Alexander, 1175. Graham Bread, 365. Grahamland, 1176, 110 Grahamland, 1176, 110. Grail, or Graal, Greal, Grasal, and Sangrael, 1176. Grain, 1176; barley, 231; buckwheat, 394; corn, 678; flax, 1012; oats, 2013; rye, 2478; wheat, Grain Elevator, 1176, 398. Grakle, or Grackle, 1176. Grain Elevator, 1176, 398.
Grakle, or Grackle, 1176, 199, 298.
Grallatores, or Waders, 1176, 199, 298.
Gram, or Gramme, 1176, 1770, 2962.
Grammar, 1176, 110, 157, 943, 2117, 2194.
Gramme, Zénobe, 851.
Grammophone, 1177, 2199.
Grampians, 1177, 435, 2561.
Grampus, 1177; dolphin, 813.
Granada, 1177, 1038, 1844, 2697.
Granada, New, 627, 868.
Granada, Spain, 1177.
Grand Army of the Republic, 1177, 1618.
Grand Canal, China, 458, 565, 2141.
Grand Canal, China, 458, 565, 2141.
Grand Forks, N. D., 1177, 1994.
Grand Haven, Mich., 1178.
Grand Island, 1967.
Grand Island, Neb., 1178, 1914.
Grand Jury. See Jury, 1480.
Grand Pré, Nova Scotia, 1178.
Grand Rapids, Mich., 1178, 1780.
Grand Rapids, Wis., 1178.
Grand Rapids, Wis., 1178.
Grand Rapids, Wis., 1178.
Grand River, 1179, 630 Grand Remonstrance, 1178. Grand Remonstrance, 1178.
Grand River, 1179, 630.
Grand River, 1179.
Grand River, Mich., 1778.
Grand Terre, 1209.
Grange, or Patrons of Husbandry, 977.
Granite, 1179, 1115, 1364.
Granite State, 1940.
Grant Frederick Dept. 1179. Grant, Frederick Dent, 1179.
Grant, George Monro, 1179.
Grant, James, 1179.
Grant, Robert, 1180.
Grant, Ulysses Simpson, 1180, 1197, 1561, 2714, 2976, 2981. Granvella, Antoine Perrenot, 1181. Granville, George Leveson-Gower, 1181, 2722. Grape, 1181, 2009, 2204, 2370. Grape Phylloxera, 2204. Grapeshot, 1182, 2621. Grape Sugar. See Glucose, 1153. Graphite, 1182, 479, 2081.

Graphophone, 1177, 2199. Grass, 1182; alfalfa, 64; bamboo, 222; blue grass, 318; clover, 607; mesquite, 1765; red top, 1269; timothy, 2880. Grass Cloth, 1182. Grasshopper, 1182, 1615. Grass Tree, 1183. Grass Valley, Cal., 1183. Gratian, Gratianus Augustus, 1183. Gratianus, 2859, 3011. Grattan, Henry, 1183, 1407. Gratz, or Graz, Austria, 1183, 2997. Gravel, 1183; sand, 2515. Gravelotte, Germany, 1183, 251, 1053. Gravitation, 1183, 1645, 1955. Gravity, 1184, 973. Gray, Asa, 1184, 644, 875, 1239. Gray, Elisha, 1184. Gray, George, 1185. Gray, Robert, 1185. Gray, Thomas, 1185, 898, 919. Grayling, 1185. Great Barrington, Mass., 1185. Great Barrington, Mass., 1185.
Great Basin, 1185, 1930.
Great Bear, 136, 253.
Great Bear Lake, 1186, 1663.
Great Britain, 1186. See England, 917.
Great Charter. See Magna Charta, 1674.
Great Dismal Swamp, 323.
Great Divide Tunnel, 2936.
Great Fastern, 1190, 427, 995. Great Eastern, 1190, 427, 995, Great Eastern, 1190, 427, 995.
Greater Antilles, 113, 1562, 3161.
Greater New York, 1639, 1964.
Great Falls, Mont., 1190, 1835.
Great Fish, or Back River, 1191.
Great Gander Lake, 1938, 1939.
Greathead, Henry, 1586.
Great Kanawha River, 1191.
Great Lakes. See Lakes, The Corp. Great Kanawha River, 1191.
Great Lakes. See Lakes, the Great, 1533.
Great Mogul, 794.
Great Pedee River, 1191, 1990.
Great Peter's Bell, 1152.
Great Plague, The, 2229.
Great Salt Lake, 1191, 2967, 3005. Great Slave Lake, 1191, 53. Great Wall of China. See CHINESE WALL, 569. Grebber, Peter, 1567.

Grebe, 1191; crested grebe, 1191.

Greece, 1191, 1207; Achaean League, 129, 676, 2195; Alexander the Great, 62; architecture, 132; Argos, 139; arms, 149; astronomy, 173; Athens, 175; Attica, 181; Boeotia, 322; colonies, 628; Corinth, 676; Delos, 777; Demosthenes, 780; drama, 825; festivals, 991; helots, 1282; Lycurgus, 1648; Draco, 823; Pericles, 2159; Solon, 2673; Macedonia, 1660; Olympic games, 2034; Parthenon, 2116; Pelasgians, 2142; Peloponnesus, 2143; Marathon, 1703; national emblem, 1020; Salamis, 2503; sculpture, 2569; Sparta, 2700; Thermopylae, 2861; Themistocles, 2858; wars with Persia, 62, 753, 2165, 2185, 3195.

Greek Church, 1196, 2200.

Greek Fire, 1196.

Greek Philosophy, 801. Grebber, Peter, 1567. Greek Pire, 1196.
Greek Philosophy, 801.
Greeley, Horace, 1196, 88, 1180.
Greely, Adolphus Washington, 1197, 2249.
Green, John Richard, 1197, 920.
Green, Seth, 1197.
Greenaway, Kate, 1197.
Greenback Money, 541, 1826.
Greenback Party, 1198, 417, 2260, 3111.

Green Bay, Wis., 1198, 3169. Green Brier. See SMILAX, 2655. Greenbush. See RENSSELAER, 2397. Greene, Nathanael, 1198, 989, 1549. Greene, Robert, 826, 919. Greenfield, Mass., 1198. Green Gage, 1198. Greenheart, or Bebeeru, 1198. Greenhouse, 1198; floriculture, 1016. Greenland, 1199, 782, 1890. Greenlet, 3053. Green Mountain Boys, 1200, 3034. Green Mountains, 1200, 3032. Green Mountain State, 3032. Greenock, Scotland, 1200 Greenough, Horatio, 1200. Greenough, Horatio, 1200. Greenough, Richard Saltonstall, 1200, 2570. Green River, 1200, 632.
Green River, 1200, 632.
Green River, 1200, 1500.
Greensboro, N. C., 1200, 1991.
Greensburg, Ind., 1200.
Greenstone, 1323, 2913.
Greenstone, 1323, 2913. Greensburg, Pa., 1200.
Greenstone, 1323, 2913.
Green Turtle, 2900.
Greenville, Miss., 1200.
Greenville, Ohio, 1201.
Greenville, S. C., 1201, 2688.
Greenville, Tex., 1201.
Greenwich, England, 1201, 1626.
Greenwich Observatory, 1201, 2015.
Greenwood, James M., 1201.
Grégoire, Henri, 1201.
Grégoire, Henri, 1201.
Gregory 1202, 2273.
Gregory 1202, 2273.
Gregory VII., Pope, 1202, 904, 2273.
Gregory XII., Pope, 1202.
Gregory XVII., Pope, 1202, 436.
Gregory XVII., Pope, 814.
Gregory XVI., Pope, 814.
Gregory XVI., Pope, 2228.
Gregory, Casper René, 1202.
Gregory, Gregory, Sir Charles, 314.
Gregory Thaumaturgus, Saint, 1202.
Gregory, Thomas Watt, 1203.
Greifswald, Germany, 1203.
Grenada, Island, 1203, 109, 3161.
Grenadier, 1203.
Grendel (monster). 277 Grenada, Island, 1203, 109, 3161.
Grenadier, 1203.
Grendel (monster), 277
Grenfell, George, 1203.
Grenoble, France, 1203.
Gresham, Sir, 1203; Gresham's Law, 1203.
Gresham, Walter Quinton, 1203.
Gresolon, Daniel, 840.
Gretna Green, Scotland, 1204. Gresolon, Daniel, 840.
Gretna Green, Scotland, 1204.
Grétry, André Ernst Modeste, 1204.
Grétry, François Paul, 1204, 598, 1050.
Grey, Albert Henry George, 1204.
Grey, Charles, 1204, 382; Grey, Elizabeth, 877.
Grey, Sir Edward, 1205.
Grey, Lady Jane 1205, 878, 1565.
Grey, Lady Jane 1205, 878, 1565.
Greyhound. See Dog, 810, 1323.
Greylock, Mount, 17, 1727.
Grieg, Edvard Hagerup, 1205, 1879.
Griemhild, or Kriemheld, 1129, 1968.
Griffin, Ga., 1205.
Griffin, Ga., 1205.
Griffis, William Elliot, 1205.
Grilse, 2506.
Grimaldi Family, 1824. Grimaldi Family, 1824. Grimes, James Wilson, 1205.

Grimm, Herman Frederick, 1205.
Grimm, Jacob Ludwig Karl, 1205.
Grimm, Wilhelm Karl, 1206, 797.
Grimm Brothers, 1026, 1129, 2194.
Grimston, Margaret Robertson, 1499.
Grindal, William, 904.
Grinding, 1206, 1788; Grindstone, 1206, 8, 2518.
Grinnell College, 1402, 1403.
Grinnell Land, 905, 1055.
Grippe. See INFLUENZA, 1387.
Griqualand, South Africa, 1206.
Grisi, Giulia, 1206, 1709.
Grisons, Switzerland, 1586, 2406.
Gristle. See Cartilage, 495.
Griswold, Rufus Wilmot, 1207.
Grodno, Russia, 1207.
Groningen, Netherlands, 1207, 1927. Grimm, Herman Frederick, 1205. Grodno, Russia, 1207.
Groningen, Netherlands, 1207, 1927.
Gronovius, Johann Friedrich, 1927.
Gross, Antoine Jean, 1207.
Grossbeak, 1207, 1974.
Grossbeak, 1207, 1974.
Grosswardein, or Nagyvarad, Hungary, 1207.
Grosswardein, or Nagyvarad, Hungary, 1207.
Grote, George, 1207, 141, 920
Grotefend, Georg Friedrich, 725.
Grotius, or De Groot, Huge, 1208, 1927.
Grouchy, Emmanuel, Marquis of, 1208,
Ground Hos. See Worchuck, 3178.
Ground Gquirrel, 1208, 2719
Grouse, 1208, 2117, 2180, capercally, 471.
Grow, Galusha Aaron 1209
Grubs, or Larvae, 269 Ground Squirrel, 1208, 2719
Grouse, 1208, 2117, 2180, capercally, 471.
Grow, Galusha Aaron 1209
Grubs, or Larvae, 26?
Grünberg, Germany, 1209
Gryffith, Llewellyn, 3072.
Guadalajara, Mcxico, 1209, 1775.
Guadalquivir River, 1209, 2694.
Guadalupe Hidalgo, Treaty of 1209, 1772.
Guadeloupe, 1209, 1562.
Guadiana River, 1210, 2694.
Guam, Island, 1210, 629, 1529, 2984.
Guan, 1210; curassow, 726.
Guanabacoa, Cuba, 1210
Guanaco, 1210, 1612.
Guanajuato. Mexico, 1210.
Guanches, 460.
Guano, 1211, 1701, 2168.
Guaporé, or Itenez River, 1211.
Guardafui, Cape, 1211, 29.
Guardian, 1211, 1386.
Guatemala, 1211, 521.
Guatemala, Central America, 1212.
Guava, 1212; jelly, 1448.
Guaviare River, 1212, 626.
Guayaquil, Ecuador, 1212, 868.
Gudgeon, 1213.
Guelph, Ontario, 1213, 2040.
Guelphs and Ghibellines, 1213, 249, 1058, 1422
Guerricke, Otto von, 44, 892.
Guernsey, Egbert, 1213.
Guernsey, Island, 1213, 532.
Guerrilla, 1848, 1856.
Guiana, 1213, 2684.
Guiana, British, or Demerara, 1214, 1189.
Guiana, British, or Demerara, 1214, 1189.
Guiana, British, or Cayenne, 1214.
Guido D'Arezzo, 1214.
Guido Reni, 1214, 519, 2081.
Guild, 1214; trades unions, 2907.
Guilder, 1826.
Guilford Courthouse, Battle of, 1215, 680. Guilder, 1826. Guilford Courthouse, Battle of, 1215, 680.

GENERAL C

Guillemot, 1215; auk, 185.
Guillotine, 1215, 1708, 2429.
Guinea, 1215, 33, 1047.
Guinea (coin), 1215, 2693.
Guinea (coin), 1215, 2693.
Guinea, Gulf of, 1215.
Guinea, Portuguese, 2287.
Guinea Fowl, or Pintado, 1216, 1208.
Guinea Pig, 1216, 514, 1133.
Guiscard, Robert, 1216, 1202, 2813.
Guise, 1216, 507, 1334.
Guitar, 1217, 1692; violin, 3051.
Guitau, Charles Jules, 1217, 1097.
Guizot, François, 1217, 1048.
Gulf Stream, 1217, 179, 728.
Gulf Weed, 1218, 728.
Gull, 1218, 298, 2647, 2847.
Gulliver's Travels, 2791.
Gum, 1218, 159, 1884, 2654.
Gum Arabic, 1218, 1389.
Gum Elastic, or India Rubber, 1383.
Gum Trees. See Eucalyptus, 943.
Gumti, or Goomti River, 1218.
Gun, 1218, 1522, 1739; air, 43; cannon, 463;
Dahlgren, 740; needle, 831; Krupp, 1522; revolver, 2404; rifle, 2420; Krag-Jorgensen, 2977; shot, 2621.
Gunboat, 1219.
Gun Carriage, 1219, 463. Gunboat, 1219.
Gun Carriage, 1219, 463.
Gun Cotton, or Pyroxylin, 1219, 850, 959.
Gundicar, King of Burgundy, 408.
Gunnery, 1220, 463.
Gunnery, 1220, 463.
Gunpowder, 1220, 959, 1078.
Gunpowder, 1221, 98-, 1435.
Gunpowder Plot, 1221, 98-, 1435.
Gunsaulus, Frank Wakeley, 1221.
Gunter, Edmund, 1221, 2782.
Gunter's Chain, 526.
Günther, 1129, 1968.
Gurnard, 1221, 1023.
Gustaf V., 1222, 283, 2788.
Gustavus II., 1222, 2788.
Gustavus III., 1223, 2788.
Gustavus III., 1223, 2788.
Gustavus IV., 1223, 4, 2788.
Gut of Canso, 468, 2494.
Gutenberg, Johannes, 1223, 981, 2313, 2950. Gunboat, 1219. Gut of Canso, 468, 2494.
Gutenberg, Johannes, 1223, 981, 2313, 2950.
Guthrie, Okl., 1223, 2028.
Guthrie, Thomas, 1223, 3254.
Gutta-Percha, 1223, 426, 897, 1598, 2630.
Gutzkow, Karl Ferdinand, 1224.
Guy of Warwick, 2439.
Guyot, Arnold, 1224.
Guzmán Blanco, Antonic, 1924. Guyot, Arnold, 1224.
Guzmán Blauco, Antonio, 1224.
Gwalior, India, 1224.
Gymnasium, 1224, 1127; athletics, 176.
Gymnastics, 1224; Delsarte, 778; manual training, 1700; physical culture, 872.
Gypsies, 1225, 2812.
Gypsum, 1225, 48, 1794, 2763.
Gypsy Moth, 1226.
Gyroscope, 1226.

\mathbf{H}

H, 1227, 2951. Haakon VII., 1227, 1999. Haarlem, Netherlands, 1227, 92. Habakkuk, 1227, 289, 2320. Habberton, John, 1227. Habeas Corpus, 1228, 661, 2986. Habib Ullah, 28, 29.

Habit, 1228; attention, 181. Habrecht, Isaac, 2756. Hack, or Hackney Coach, 1228, 609. Hack, or Hackney Coach, 1228, 609.
Hackberry, 1228; sugar hackberry, 1228.
Hackensack, N. J., 1228.
Hackett, James Keteltas, 1228.
Hadassah, 938.
Haddock, 1229, 1006.
Hades. See Hell, 1281, 2057.
Hadj. See Hall, 1234.
Hadley, Arthur Twining, 1229.
Hadley, James, 1229.
Hadrian, Arch of, 1229.
Hadrian, Publius, 1229, 115, 2444.
Haeckel, Ernst Heinrich, 1230, 875, 956, 3225.
Hafiz, 1230, 2165.
Hagar, 1416. Hafiz, 1230, 2165.
Hagar, 1416.
Hagen, Germany, 1230.
Hagenbeck, Karl, 1230.
Hagerstown, Md., 1230, 1723.
Hagfish, or Hag, 1230; lamprey, 1536.
Haggai, 1231, 289, 2320.
Haggard, Henry Rider, 1231, 920, 2004.
Hague, Peace Conference, 151, 1231.
Hague, The, Holland, 1231, 1927.
Hahnemann, Samuel, 1231, 73, 1315.
Hail, 1232; cloud, 606; snow, 2665.
Hailmann, William Nicholas, 1232.
Hair, 1232, 253.
Hair Dressing, 1233.
Hair Dressing, 1234.
Hairless Dog, 1234. Hairless Dog, 1234. Haiti. See HAYTI, 1271. Hajj, or Hadj, 1234, 1819; Kaabe, 1483. Hakluyt, Richard, 1234. Hakluyt, Richard, 1234, 1819; Kaabe, 1483.
Hakluyt, Richard, 1234,
Hako I., of Norway, 1999.
Hako, or Hakon III., of Norway, 1706.
Hakodadi, or Hakodate, Japan, 1234.
Halbard, or Halberd, 1234; halbardiers, 1234.
Halberstadt, Germany, 1234, 268.
Haleyon, 1235; kingfishers, 1509.
Hale, Edward Everett, 1235, 89.
Hale, Edward Everett, 1235, 89.
Hale, Eugene, 1235.
Hale, John Parker, 1235, 1582.
Hale, Sir Matthew, 1235.
Hale, Nathan, 1235, 2718.
Haler, Alexander of, 2553.
Halévy, Joseph, 1235.
Halévy, Ludovic, 1236.
Half Moon, The, 1958.
Half Tone, 1236, 924.
Haliburton, Thomas Chandler, 1236, 2327.
Halibut, 1236, 1012.
Halicarnassus, 1294.
Halidon Hill 877 Halicarnassus, 1294. Halidon Hill, 877. Halidon Hill, 877.
Halifax, England, 1236.
Halifax, Nova Scotia, 1237, 2003.
Halifax, Charles Montagu, 1237.
Hall, Asaph, 1237, 1715.
Hall, Charles Francis, 1237.
Hall, Granville Stanley, 1238, 595, 876.
Hall, John, 1238.
Hall, Lyman, 2995.
Hall, Robert, 1238.
Hallam, Arthur Henry, 1238, 2845. Hallam, Arthur Henry, 1238, 2845. Hallam, Arthur Henry, 1238, 1604. Halle, Germany, 1238, 1125. Halle, University of, 1238, 2997. Halleck, Fitz-Greene, 1239, 354, 824. Halleck, Henry Wager, 1239. Hallelujah, or Halleluiah, 1239.

Haller, Albrecht von, 1239, 2795, 3238. Halley, Edmund, 1239, 639. Halley's Comet, 640. Hall of Fame, 1239. Halloween, 1240. Hallucination, 1240, 777. Halo, 1240, 607, 2105. Halpine, Charles Graham, 1240. Halpine, Charles Granam, 1240. Hals, Frans, 1240. Halstead, Murat, 1240. Ham (meat), 1240, 1745, 2792. Ham, 1240, 451, 730. Hamadan, 863. Haman, 938. Haman, 938.
Hamath, or Hamah, Syria, 1240.
Hamburg, Germany, 1240, 1128.
Hamerton, Philip Gilbert, 1241.
Hamilcar, 1241, 494, 1248.
Hamilton, Australia, 1241, 3045.
Hamilton, Bermudas. 1241, 282.
Hamilton, Ohio, 1241, 2024.
Hamilton, Ontario, 1241, 2040.
Hamilton, Alexander, 1242, 1239, 2989, 2991.
Hamilton, Gail, 809, 2327.
Hamilton, John, 2563.
Hamilton, Sir William, 1242, 1619, 3234.
Hamites, or Hamitic, 1243.
Hamlet, or Amleth, 1243, 2603.
Hamlin, Hannibal, 1243, 2976.
Hamline University, 2498. Hamlin, Hannibal, 1243, 2976.
Hamline University, 2498.
Hamm, Germany, 1243.
Hammer, 1243, 2735.
Hammer, or Malleus, 854.
Hammond, Ind., 1243.
Hammond, John Hayes, 1243.
Hammond, William Alexander, 1243.
Hampden, John, 1244.
Hampton, Wade, 1244, 2855, 3084.
Hampton, Wade, 1244.
Hampton Court Conference, 1244.
Hampton Normal and Agricultural Co Hampton Normal and Agricultural College, 1244.
Hampton Roads, 1245, 1037, 1827.
Hampton Roads Conference, 1245.
Hamster, 1245. Hancock, Mich., 1245. Hancock, John, 1245, 769, 2994. Hancock, Winfield Scott, 1245, 1097. Hancock, Winfield Scott, 1245, 1097.
Hand, 1246, 146, 2646.
Handeck, Falls of, I.
Handel, George Frederick, 1246, 175, 1130, 1879.
Hanford, T. W., 3234.
Hang-Chow, China, 1247.
Hanging, 1247, 475.
Hanging Gardens, 1247, 205, 2595.
Hankow, China, 1247.
Hanley, England, 1247.
Hanna, Marcus Alonzo, 1248.
Hannay, James, 1248.
Hannibal, or Annibel, 1248, 283, 462, 494, 2443, 2697. 2697.
Hannibal, Mo., 1249, 1813.
Hanno, 562, 1241.
Hanoi, Indo China, 1249, 1385.
Hanover, or Hannover, 1249, 2325.
Hanover, Germany, 1249, 2325.
Hanover, House of, 922, 2344, 2762.
Hanover, N. H., 1249.
Hanover, Pa., 1249.
Hansborough, Henry Clay, 1249.
Hanseatic League, or Hansa, 1250, 388, 626, 640, 751, 819, 1241, 1641, 2221.

Hansen, Gerhard Henrik Armauer, 1250. Hanslick, Eduard, 1250. Hapsburg, House of, 1250, 185, 1131, 1927. Hara-Kiri, or Seppuku, 1250. Harbor, 1251, 3132; New York, 1959. Harbor Grace, Newfoundland, 1251, 1939. Hara-Kiri, or Seppuku, 1250.
Harbor, 1251, 3132; New York, 1959.
Harbor Grace, Newfoundland, 1251, 1939
Harburg, Germany, 1251.
Harcourt, Richard, 1251.
Hardecanute. See Canute, 467, 783, 921.
Hardecanute. See Canute, 467, 783, 921.
Hardece, William Joseph, 1251.
Hardenburgh, John L., 182.
Hardenburgh, John L., 182.
Hardness, 1251, 1794, 2840; matter, 1735.
Hardy, Thomas, 1252, 920.
Hare, 1252, 2359.
Hare, Julius, 920.
Hare, Julius, 920.
Harebell, or Bluebell, 1252, 449.
Harem, 1252, 585.
Hargreaves, James, 1252, 687.
Harkavy, Avraam, 1253.
Harlan, John Marshall, 1253.
Harlan, John Marshall, 1253.
Harland, Henry, 1253, 89.
Harland, Marion, 2327, 2846.
Harlem River, 1253, 2693.
Harmonica, 1254; mouth organ, 1254.
Harmonics, 1254.
Harmonium, 12.
Harmonium, 12.
Harmony of the Spheres, 1254.
Harnack, Adolf, 1254.
Harnack, Theodosius, 1254.
Harnold, Of Norway, 1254, 1999, 2055.
Harold II., of Denmark, 1254, 922.
Harold III., of Norway, 1254.
Haroun-al Raschid, 1255, 126, 210.
Harper's Ferry, W. Va., 1255, 384, 1480.
Harpies, 1255.
Harpignies, Henri Joseph, 1256.
Harpignies, Henri Joseph, 1256.
Harpischord, 1286, 2908 Harpies, 1255.
Harpignies, Henri Joseph, 1256.
Harpoon, 1256, 3132.
Harpsichord, 1256, 2208.
Harpsichord, 1256, 2208.
Harpy, 1256; eagle, 852.
Harraden, Beatrice, 1256.
Harrar, Abyssinia, 10.
Harriman, Edward Henry, 1256, 1005.
Harris, Joel Chandler, 1256, 2327.
Harris, Robert, 1257.
Harris, William Torrey, 1257, 383, 875.
Harrison, Pa., 1257, 2151.
Harrison, Benjamin, 1257, 2995.
Harrison, Benjamin, 1257, 602, 2976.
Harrison, Carter Henry, 1258. Harrison, Carter Henry, 1258. Harrison, Carter Henry, 1258.
Harrison, Constance Cary, 1258.
Harrison, William Henry, 1258, 2882.
Harrow, 1259; disk harrow, 1259.
Hart, Albert Bushnell, 1259.
Hart, Joen T., 1259.
Hart, John, 2995.
Hart, John, 2995. Harte, Francis Bret, 1259, 88, 2004. Hartford, Conn., 1260, 656. Hartford City, Ind., 1260. Hartford Convention, 1260.

Hartmann, Eduard von, 1129, 2170. Hartmann, Eduard von, 1129, 2170.
Hartmann, Karl Robert Eduard, 1260.
Hartmann, Ludwig, 1130.
Hartshorn, 1261, 90.
Harun al-Raschid, 1255, 126, 210.
Harvard, John, 1261.
Harvard Observatory, 1261.
Harvard University, 1261, 444.
Harvard University Library, 1261, 1584.
Harvard Rug, 1261 Harvest Bug, 1261, Harvesting Machinery, 1261, 2382. Harvest Moon, 1262. Harvest Mouse, 1864. Harvest Mouse, 1864.
Harvey, III., 1262.
Harvey, William, 1262, 315, 1748.
Harz, or Hartz, Mountains, 1262, 1125.
Hasdrubal, or Asdrubel, 1262, 493, 1248.
Hashish, or Hasheesh, 1262, 1284.
Hassel, Paul, 1130.
Hassler, E. R., 611.
Hastings, Battle of, 248, 1255.
Hastings, England, 1263.
Hastings, Neb., 1263, 1914.
Hastings, Warren, 1263, 409, 2612.
Hat, 1263, 985, 2758.
Hathaway, Anna, 2602. Hat, 1263, 985, 2758.

Hat, 1263, 985, 2758.

Hathaway, Anna, 2602.

Hatteras, Cape, 471.

Hats and Caps, 2788.

Hatton, Joseph, 1263.

Haupt, Paul, 1264.

Hauptmann, Gerhart, 1264, 1130.

Haussmann, Georges Eugène, 1264.

Hauteville, Roger de, 2628.

Haüy, René Just, 1795.

Havana, Cuba, 1264, 581.

Havel River, 359.

Havelock, Sir Henry, 1265, 1553, 1643, 1890.

Havergal, Frances Ridley, 1353.

Haverhill, Mass., 1265, 1729.

Haverstraw, N. Y., 1265.

Havre, France, 1265, 1047.

Hawki, 1968, 200, 071 Hawre, France, 1205, 1047.

Hawaii, or Hawaiian Islands, 1265, 1591, 2984.

Hawk, 1268, 298, 971.

Hawkeye State, 1400.

Hawkins, Anthony Hope, 1268.

Hawkins, Sir John, 1268, 2651.

Hawksbill, or Caret, 1268, 2900.

Hawley, Joseph Roswell, 1268.

Hawthorn, 1268; thorn apple, 1268.

Hawthorne, Lulian, 1268. Hawthorn, 1268; thorn apple, 1268.
Hawthorne, Julian, 1268,
Hawthorne, Nathaniel, 1269, 86, 1239, 1606.
Hay, 1269; clover, 607; ensilage, 924; lentil, 1570; red top, 2387; timothy, 2880.
Hay, John, 1269, 486; 571.
Hayden, Ferdinand Vandeveer, 1270.
Haydn, Joseph, 1270, 1130, 1879, 3238.
Haydon, Benjamin Robert, 1270.
Hayes, Isaac Israel, 1270.
Hayes, Rutherford Birchard, 1270, 889, 2879, 2976. Hay Fever, 1271; fever, 993. Hayne, Robert Young, 1271, 87, 3114. Hay-Pauncefote Treaty, 1271, 2127. Hay River, 1271.
Hayti, or Haiti, 1271, 2516, 2904, 3126.
Hayward, Jr., Thomas, 2995.
Haze, 1272; heat haze, 1272.
Hazel, 1272, 2008, 3171.
Hazen, William Babcock, 1273.
Hazleton, Pa., 1273.

Hazlitt, William, 1273, 768, 3235.
Head, 1273, 2646, 2648.
Headache, or Cephalalgia, 1274, 1928.
Health, Board of, 1274; hygiene, 1351.
Hearing, 853, 2588.
Hearne, Samuel, 456.
Hearst, Mrs. Phoebe A., 440.
Hearst, William Randolph, 1274, 1871.
Heart, 1274; artery, 155; blood, 314; circulation, 585; muscles, 1876; pulse, 2333; veins, 3025. 3025 Heart's Content, 426, 1939. Heart of Midlothian, 2566. Heart of Midlothian, 2566.
Heart Stroke, 102.
Heart wood, 56, 863.
Heat, 1275, 1076, 1080.
Heath, 1275, 129; heather, 1021.
Heating, 1352, 2362, 2753.
Heaven, 1276; immortality, 1370.
Heaves. See Broken Wind, 380.
Heaveysege, Charles, 1276.
Hebbel, Carl Friedrich, 1130.
Hebel, 1276, 1291.
Hebel, Johann Peter, 1276.
Heber, Reginald, 1276, 3237.
Hébert, Jacques René, 1276.
Hébert, Louis Philippe, 1276.
Hebrews. See Jews, 1455.
Hebrews, Epistle to the, 1276, 289.
Hebrides, or Western Islands, 1277, 2561; Iona, 1400; Skye, 2649.
Hebron, Mount, 2084.
Hebron, Palestine, 1277, 758.
Hecate, 1277.
Hecla, or Hekla, 1277. Hecla, or Hekla, 1277. Hectare, 136. Hector, 1277, 14, 100, 2926. Hecuba, 1277, 498, 2307. Hecuba, 1277, 498, 2307.

Hedgehog, 1277.

Hegel, Georg, 1278, 1129, 1363, 2196.

Hegira, or Hijra, 1278, 929, 1818.

Heiberg, Peder Andres, 783, 826.

Heidelberg, Germany, 1278, 1125.

Heidelberg, University of, 1278, 2997.

Heilbronn, Germany, 1278, 1916.

Heilprin, Angelo, 1278.

Heimdall, 1279.

Heimdall, 1279.

Heime, Heinrich, 1279, 1130, 2245.

Heintzelman, Samuel Peter, 1279.

Heir, 1279; will, 3149.

Hektograph, 671.

Hel, 1279, 1620, 1973.

Helder, Netherlands, 1279.

Helen, See Helen of Troy, 1280.

Helena, Ark., 1280.

Helena, Mont., 1280, 1835.

Hellena of Troy, 1280, 34, 2925.

Helfert, Alexander, 1280.

Helgoland, 1280, 3048, 3153.

Helicor, or Sagara Mountains, 1280, 1

Helicor, or Sagara Mountains, 1280, 1 Hedgehog, 1277. Helgoland, 1280, 3048, 3153.
Helicon, or Sagara Mountains, 1280, 1878.
Heliograph, 2633; heliography, 2201.
Heliometer, 1058.
Heliopolis, 1280.
Helios, or Helius, 1281, 2780.
Heliotrope, 1281, 1021.
Heliotrope, or Bloodstone, 1281, 1444.
Helium. See Chemistry, 545.
Hell, 1281; Elysium, 908.
Hell-Divers, 1191.
Hellebore, 1281, 2246.
Hellenes, 1195.
Heller, Stephen, 1281.

Hellespont, 860. See DARDANELLES, 753. Hell Gate, 1282, 311, 1955. Hell Gate Pass, 1282, 1959. Helmers, Jan Frederik, 1927. Helmet, 1282; armor, 148. Helmholtz, Hermann von, 1282, 16. Helmers, Jan Frederik, 1927.
Helmet, 1282; armor, 148.
Helmholtz, Hermann von, 1282, 16.
Hélocoptère, 1024.
Héloīse, See Abélard, 6.
Helots, 1282, 2700.
Helsingborg, or Hälsingborg, 1282.
Helsingfors, Finland, 1282, 1000, 2997.
Helvetius, Claude Adrien, 1048, 1063.
Helvetii, 1282, 2795.
Hely-Hutchinson, Sir Walter Francis, 1283.
Hemans, Felicia Dorothea, 1283, 3238, 3243, 3246.
Hemans, Felicia Dorothea, 1283, 3238, 3243, 3246.
Hemans, Felicia Dorothea, 1283, 1409.
Hemenway, James Alexander, 1283.
Hemiptera, 1283, 1393.
Hemiptera, 1283, 856, 929.
Hemlock, 1283, 2246, 3206.
Hemlock Spruce. See Spruce, 2717.
Hemorrhage, 2590, 2709, 2765.
Hemp, 1284, 993; India hemp, 2246.
Hemp Brake, 1103.
Henderson, Ky., 1284.
Henderson, Richard, 2429.
Hendricks, Thomas Andrew, 1284, 2976.
Hengist and Horsa, 1284.
Hen Hawk, 1168, 1268.
Henley, William Ernest, 1284.
Henley Regatta, 1284, 2457.
Henlopen, Cape, 471, 776.
Henne-am-Rhyn, Otto, 1285.
Henne, Louis, 1285, 1802.
Hennerit Maria, Princess, 393, 536.
Henry, Cape, 471, 1983.
Henry, Fort, 816.
Henry, The Lion, 1285.
Henry II., of Germany, 1285, 1130, 2543.
Henry III., of Germany, 1285.
Henry IV., of Germany, 1285.
Henry IV., of Germany, 1285.
Henry VI., of Germany, 1285, 1423.
Henry VI., of Germany, 1285, 1423.
Henry, Ot Saxony, 1285.
Henry VII., of Germany, 1285, 1423.
Henry, Ot Saxony, 1285.
Henry IV., of Germany, 1285, 1423.
Henry, V., of England, 1286, 922.
Henry III., of England, 1286, 922.
Henry IV., of England, 1286, 2413, 2451.
Henry VII., of France, 1287.
Henry III., of France, 1287. 2564, 2932.

Henry I., of France, 1287.

Henry II., of France, 1287.

Henry III., of France, 1287, 1217.

Henry IV., of France, 1288, 536, 1049, 1909.

Henry, Caleb Sprague, 1288.

Henry, Joseph, 1288, 2661.

Henry, Patrick, 1288, 85, 3056.

Henry the Navigator, 1289, 2288.

Henschel, Georg, 1289.

Henty, George Alfred, 1289.

Hepatica, 1289, 1021.

Hepatic Artery, 1609; vein, 2208.

Hepburn, William Peters, 1289.

Hephaestus. See Vulcan, 3065.

Heptarchy, 1289, 921. Heptasophs, Improved Order, 274. Hera, or Here, 1479, 2034, 2584, 3219. Heraclius, 9, 423. Heraclius, 9, 423.
Herald, 1289.
Heraldry, 1290; chivalry, 570.
Herat, Afghanistan, 1290, 28.
Herb, 1290; botany, 346; plants, 2232.
Herbaccous Plants, 2374.
Herbart, Johann Friedrich, 1290, 682, 1130.
Herbert, George, 1290, 3079, 3246, 3255.
Herbert, Hilary Abner, 1291.
Herbert, Wichael Henry, 1291.
Herbert, Victor, 1291.
Herbert of Cherbury, 919.
Herbivorous Animals, 486. Herbert, Victor, 1291.
Herbert of Cherbury, 919.
Herbivorous Animals, 486.
Herculaneum, Italy, 1291, 3061.
Hercules, 1291, 901, 1276, 1296.
Hercules, Pillars of, 1139.
Hercules Beetle, 1291; beetle, 263.
Herder, Johann Gottfried, 1291, 1129, 3118.
Heredity, 1292; crime, 704.
Hereford, England, 1292; cattle, 511.
Heresy, 1292, 1390, 1391.
Hering, Ewald, 1292.
Herkimer, N. Y., 1292.
Herkimer, N. Y., 1292.
Herkimer, Nicholas, 1293, 1464.
Herkomer, Hubert von, 1293.
Hermann, Johann Gottfried Jakob, 1293.
Hermann and Dorothea, 1159.
Hermes, 1651, 1759, 2163.
Hermit, 1293, 716, 2174.
Hermitage, 1293, 1899.
Hermitage Palace, 2499.
Hermit Crab, 1293, 695.
Hermon, Mount, 1293, 1557.
Hermosillo, Mexico, 1293. Hermit Crab, 1293, 695.
Hermon, Mount, 1293, 1557.
Hermosillo, Mexico, 1293.
Herne, James A., 1293.
Hernia, 1293, 2781; abdominal hernia, 1294.
Hero, 1294, 753.
Herod, The Great, 1294, 1453, 1457.
Herod Agrippa I. See Agrippa I., 40.
Herod Antopas, 1294, 1462.
Herodotus, 1294, 171, 687, 1193.
Heroic Age, 35, 1195.
Heron, 1294, 302, 881, 1974.
Hero of Alexandria, 1295.
Herrick, Robert, 1295, 3252.
Herrick, Robert, 1295, 3252.
Herrick, Robert, 1295.
Herring, 1295, 1006, 2529.
Herrinhut, 1845, 3122, 3221.
Herron, George Davis, 1295.
Herschel, Caroline Lucretia, 1295, 1296.
Herschel, Sir John Frederick, 1296.
Herschel, Sir William, 1296, 1788, 3000.
Herzegovina, 1296, 196, 282, 860.
Herzegovina, 1296, 191.
Hesperus, 1642, 3030.
Hesse, or Hesse-Darmstadt, 1296, 1128.
Hesse-Nassau, 1297, 2325.
Hessian Fly, 1297, 1393, 3134.
Hevelius, Johannes, 1843.
Hevelius, Johannes, 1843.
Hewes, Joseph, 2995.
Hewitt, Abram Stevens, 1297, 486, 668.
Hewlett, Maurice Henry, 1297.
Hexateuch, 2154.
Heyburn, Weldon Brinton, 1297.
Heyse, Paul Johann, 1297, 1130.
Hezekiah, 1297, 1456.

Hiawatha, 1297, 1625; Falls of, 1798. Hibbing, Minn., 1298. Hibernation, 1298, 2233, 2652. Hibernia, or Iverna, 1298. Hibernia, or Iverna, 1298.
Hibernians of America, Order of, 274.
Hibiscus, 1298; mallow, 1685.
Hiccough, 1298, 794.
Hickory, 1298, 2008, 2135.
Hicks, Elias, 2345.
Hicks, Thomas Holliday, 1298.
Hicks-Beach, Sir Michael Edward, 1299.
Hicksites, 2345.
Hicks Pasha, 1677.
Hidalgo, Miguel, 1733. Hidalgo, Miguel, 1733. Hides, 1299, 1556. Hierarchy, 1299; hieratic writing, 1299. Hiero I., of Syracuse, 1299, 2800. Hiero II., of Syracuse, 1299, 2800. Hierocles, 1299. Hierocies, 1299.
Hieroglyphics, 1299, 873, 883, 3188.
Higgins, Frank Wayland, 1300.
Higginson, Henry L., 486.
Higginson, Thomas Wentworth, 1300, 89.
High German, 1128, 2236.
Highland Mary 419. High Gerhali, 1126, 2230.
Highlanders, Scotch, 538.
Highland Mary, 413.
Highlands, N. Y., 1956, 2338.
Highlands, Scotland, 518, 2561.
High Priest, 1300, 2, 2308.
High School. See EDUCATION, 872.
Highway, 1300, 2206, 2426.
Hildebrand, 1969.
Hildebrand, Hans Olaf, 1300.
Hilderth, Richard, 1301.
Hilgard, Mount, 3005.
Hilgard, E. W., 38.
Hill, Ambrose Powell, 1301.
Hill, Daniel Harvey, 1301.
Hill, Daniel Harvey, 1301.
Hill, David Bennett, 1301, 953.
Hill, David Jayne, 1301.
Hill, Iames J., 1301, 1256.
Hill, Robert Thomas, 1302.
Hill, Rowland, 2778. Hill, Robert Thomas, 1302.
Hill, Rowland, 2778.
Hills, Newell Dwight, 1302.
Hillsboro, Tex., 1302.
Hilo, Hawaii, 1302, 1267.
Hilum, or Scar, 2579.
Himalaya Mountains, 1302, 954, 1374.
Hincks, Sir Francis, 1302.
Hindenburg, General von, 1302, 219.
Hindley, Charles, 2618; Hindukoh, 1302.
Hindu-Kush Mountains, 1302, 28, 2073.
Hindus, 159, 512; language, 1377, 1540; literature, 1377, 2523; mythology, 1885; thugs, 2872; writing, 3188. writing, 3188.
Hindus, or Brahmans, 357, 2394.
Hindustan, 1303; India, 1373.
Hinkson, Katharine Tynan, 1303.
Hinnom, Valley of, 1107, 1451.
Hinsdale, Burke Aaron, 1303.
Hipparchus, 1303, 173, 2302, 3223.
Hippocampus, or Sea Horse, 1303.
Hippocrates, 1303, 1116, 1748.
Hippocrene, Fountain of, 1280.
Hippodrome, 1303, 586, 2034.
Hippodrome, 1303, 586, 2034.
Hipponicus, 57.
Hippopotamus, 1304, 469, 2407.
Hiram, of Tyre, 2197.
Hiroshima, Japan, 1304.
Hirsch, Emil Gustav, 1304.
Hirsch, Maurice, Baron, 1304. writing, 3188. Hirsch, Maurice, Baron, 1304.

Hisgen, Thomas L., 2261. Hispaniola, 635, 636. Histology, 1305, 2206. History, 1305, 223, 296, 729, 1137. History, Methods of Teaching, 1305. Hitchcock, Edward, 1307. Hitchcock, Ethan Allen, 1307. Hitchcock, Frank Harris, 1307. Hitchcock, Frank Harris, 1307. Hitchcock, Henry, 486. Hitchcock, Roswell Dwight, 1308. Hittites, 1308, 451, 2084. Hives, or Nettle-Rash, 1308. Hivites, or Nettle-Rash, 1506. Hivites, 2084. Hoang-Ho, or Yellow River, 1308, 563. Hoar, Ebenezer Rockwood, 1308, 3097. Hoar, George Frisbie, 1308, 697. Hobart, Tasmania, 1308, 2823. Hobart, Garrett Augustus, 1308, 2976. Hobart College, 1109. Hobart, Tasmania, 1308, 2823.
Hobart, Garrett Augustus, 1308, 2976.
Hobart College, 1109.
Hobbema, Meindert, 1308.
Hobbes, Thomas, 1309, 919, 2729.
Hoboken, N. J., 1309, 1945.
Hobson, John Atkinson, 1309.
Hobson, Richmond Pearson, 1309, 2699.
Hobson's Choice, 1309.
Hochkirch, Genmany, 1309.
Hochkirch, Genmany, 1309.
Hochkirch, Genmany, 1309.
Hoe, Richard March, 1310, 2314.
Hofer, Andreas, 1310, 2954.
Hoffmann, Johann Jacob, 914.
Hofmann, August Wilhelm, 1310, 546.
Hofmann, Josef, 1310.
Hog. See Swine, 2792, 206, 1240.
Hogan, 1968, 1969.
Hogarth, William, 1310.
Hogg, James Stephen, 1310.
Hohenlinden, Germany, 1310, 2362.
Hohenlohe, Prince of, 1448.
Hohenstaufen, 1311, 1131, 1893.
Hohenzollern, Germany, 1311, 2325.
Hohenzollern, Germany, 1311, 2325.
Hohenzollern, House of, 359, 1131, 1311, 2326.
Holbein, Hans, 1311, 1671.
Holbein, Hans, 1311, 1671.
Holber, Ludvig, 783.
Holden, Edward Singleton, 1311.
Holder, Charles Frederick, 1311.
Holland. Mich., 1312.
Holland. See Netherlands, 1924.
Holland, Josiah Gilbert, 1312, 89, 3235, 3248, 3255.
Hollands, 311; linen, 1597. 3255. Hollands, 311; linen, 1597. Hollands, 311; Innen, 1597. Holloway, David P., 40. Holly, 1312. Holly, Marietta, 89. Hollyhock, 1312, 1685, 1717. Holman, William Steele, 1312. Holmes, Oliver Wendell, 1313, 87, 1606. Holmium, 547. Holmium, 547.
Holofernes, 1476, 3002.
Holst, Hermann von, 1313, 88, 875, 1604.
Holston River, 1314, 2842.
Holt, Joseph, 1314.
Holy Alliance, 1314, 61.
Holy City, 1451; Zionists, 3221.
Holy Family, 1314; Madonna, 1671.
Holy Ghost, or Holy Spirit, 1156, 1453, 2920.
Holy Grail, 1013, 1150, 1176, 1619.
Holy Land, 716, 2083; Promised Land, 1858.

Holyoake, George Jacob, 1314, Holy of Holies, 1300, 2803. Holyoke, Mass., 1314, 1729. Holyoke, Mount, 1314. Holyoke, Mount, Seminary, 1651, 2692. Holy Roman Empire, 1314, 1285. Holy Roman Empire, 1514, 1256. Holyrood House, 870. Holy Sepulcher, 1315, 1452, 2084. Holy Thursday, 160, 979, 1315. Holy Water, 1315. Holy Week, 1315, 1737. Home, D. D., 2711. Home Circle, 274. Homeonathy, or Homoeopathy, 1. Home Circle, 274.
Homeopathy, or Homoeopathy, 1315, 1231, 1749.
Homer, 1315, 1194, 2245, 2925.
Homer, Winslow, 1316.
Home Rule, 1316, 1148, 1408, 1581.
Homestead, Pa., 1316.
Homestead Act, 1316, 2303.
Homicide, 1316, 1873.
Honduras, 1317, 521.
Honduras, Bay of, 1317 Honduras, Bay of, 1317. Honduras, British, 267, 521, 1211. Hone, or Whetstone, 1317; grindstone, 1206. Hone, or Whetstone, 1317; grindstone, Honey, 1317, 258, 607.
Honey Locust, 1318; acacia, 11.
Honeysuckle, 1318, 1021, 3041, 3117.
Hong-Kong, or Hiang-Kiang, 1318.
Honiton Lace Industry, 1528.
Honolulu, Hawaiian Islands, 1318, 1267.
Honorius, Flavius, 1318, 49, 2444, 2744.
Hood, John Bell, 1318, 1899, 2865.
Hood, Mount, 1318, 496.
Hood, Robin, 1318, 373, 2614.
Hood, Thomas, 1319, 1055.
Hooded Seal. See Seal, 2573.
Hoof, 167, 1889, 2960.
Hooft, Pieter, 1927. Hoof, 167, 1889, 2960. Hooft, Pieter, 1927. Hooker, Joseph, 1319, 532, 1134. Hooker, Joseph Dalton, 1319. Hooker, Mount, 1319, 452. Hooker, Richard, 1319, 3079. Hooker, Thomas, 1319. Hooks and Eyes, 420. Hooper, William, 2995. Hoopoe, 1319, 2195. Hoopskirt. 706. Hoopoe, 1319, 2195.
Hoopskirt, 706.
Hoorne, or Horn, Philippe, 1320, 881.
Hoosac Mountain, 1320, 1727.
Hoosac Tunnel, 1320, 1730.
Hoosick Falls, N. Y., 1320.
Hoosick River, 1320.
Hoosier State, 1378.
Hop, 1320, 261; moth, 1859.
Hope College, 1312.
Hopkins, Albert J., 1320.
Hopkins, Johns, 1320, 1462.
Hopkins, Mark, 1321, 525, 3252.
Hopkins, Mark, 1321, 525, 3252.
Hopkinson, Francis, 1321, 86, 2995.
Hopkinson, Joseph, 1321, 86.
Hopkinsville, Ky., 1321.
Hor, Mount, 2.
Horace, Quintus, 1321, 2245, 2445. Hor, Mount, 2.
Horace, Quintus, 1321, 2245, 2445.
Horeb, Mount. See Sinal, 2640.
Horehound, 1322, 1525.
Horizon, 855, 1887, 2948, 3223.
Horn, 1322, 511, 904, 1155, 2433.
Horn, 1322; saxhorn, 2542.
Horn, Cape, 471, 2877.
Hornbeam, 1322; ironwood, 1412.
Fornbill, 1323, 3179.

Hornblende, 1323, 1432, 2915. Horned Toad, or Horned Frog, 1323. Hornellsville, N. Y., 1323. Horner, Francis, 871. Hornet, 1323, 3099. Hornet, The, 212, 234. Hornless Cattle, 511. Hornless Cattle, 511. Horsa, 1284. Horse, 1323, 167, 3216; broken wind, 380. Horse Chestnut, 1324, 551. Horse Fair, 333. Horse Power, 1325. Horse-Radish, 1325, 1290, 2210. Horseshoe, 1325. Horseshoe Crab. See King Crab, 1509. Horseshoe Falls, 1967. Horseshoe Magnet, 147, 1675. Horsetail Rush, or Scouring Rush, 1325. Horsley, Victor Alexander Haden, 1325. Horta, 982. Hortense, Eugénie, 254, 1896. Hortense, Eugenie, 254, 1896. Hortensius, 3036; Hortensian law, 2237. Horticulture, 1325, 396, 1175, 1346, 2007. Hose (fire), 1002, 1384. Hosea, 1326, 289, 2320. Hosmer, Harriet, 1326, 2570. Hospital, 1326, 1041. Hospitalers, 1514, 2492. Hot, or Thermal, Springs, 306, 2715, 3204. Hotchkiss, Benjamin Berkely, 1327. Hot, or Thermal, Springs, 306, 2715, 3204. Hotchkiss, Benjamin Berkely, 1327. Hotel, 1327; American and European plans, 1327. Hot Springs, Ark., 1327, 247. Hot Springs, S. D., 247, 2690. Hottentot, 1327, 470, 1053; Bushmen, 1913. Hottinger, Johann Heinrich, 2795. Houden, Jean Antoine, 1327, 2415, 2570. Houghton, Mich., 1327, 1778. Houghton, Richard Monckton Milnes, 1299. Hound, 1327, 315, 811, 1044, 2721. Hourglass, 1328, 605. House Boat, 1328. House Boat, 1328. House Fly. See Fly, 1022. House of Commons, 455, 1188, 2111. House of Lords, 1188, 2111. House of Lords, 1188, 2111. House of Representatives, 653, 2976. Houston, Tex., 1328, 2853. Houston, Samuel, 1328, 2524, 2853. Hovey, Richard, 1328, 89. Howard, Catherine, 1287. Howard, Charles, Lord Howard, 146. Howard, John, 1329. Howard, Oliver Otis, 1329, 1062. Hotchkiss, Benjamin Berkely, 1327. Howard, Guy, 1329.
Howard, Oliver Otis, 1329, 1062.
Howard, Oliver Otis, 1329, 1062.
Howe, Elias, 1329, 2599.
Howe, Julia Ward, 1329, 1353.
Howe, Richard, 1329, 368.
Howe, Richard, 1329, 368.
Howe, Dr. Samuel G., 372, 983.
Howe, Timothy Otis, 1329.
Howe, Sir William, 1329, 405, 1625.
Howells, Henry James, 89.
Howells, William Dean, 1330, 89, 1606, 2004.
Howitt, William and Mary, 1330.
Howitzer, 463, 1218, 2806.
Howland, Sir William Pierce, 1330.
Howler, or Stentor, 1330; monkey, 1828.
Howrah, India, 1330.
Hoy Island, 2055. Hoy Island, 2055. Hoyt, John Wesley, 1330. Hubbard, Elbert, 1331.

Huber, François, 1331, 1109. Huckleberry, or Whortleberry, 1331. Huddersfield, England, 1331. Hudson, Mass., 1331; Hudson, N. Y., 1331. Hudson, Henry, 1331, 135, 1958. Hudson, Jeffery, 847. Hudson Bay, 1331, 451, 1497. Hudson River, 1332, 1819, 1959. Hudson River Tunnel, 2936. Hudson's Bay Company, 1332, 2464. Hudson Strait, 1332, 2959. Hué, Anam, 1332, 94; Hue and Cry, 1332. Hué, Anam, 1332, 94; Hue and Cry, 1332. Huerto, Victoriano, 1776. Hugh Capet, 1332, 472, 1049. Hughes, Archbishop John, 1657. Hughes, Charles Evans, 1332. 1274. Hughes, James Laughlin, 1333. Hughes, Sir Samuel, 1333. Hughes, Thomas, 1333, 2004, 2460. Hughitt, Marvin, 1333. Hughi, or Hoogly, River, 1333, 1094. Hugo, Victor Marie, 1333, 285, 826, 1048. Huguenots, 1334, 238, 623, 1049, 1288. Hull, or Kingston-upon-Hull, England, 1335. Hull, Quebec, 1335, 2350. Hull, Isaac, 1335, 661. Hull, William, 1335, 1780. Hull House, 1335, 20. Humane Societies, 558, 715. Humane Societies, 558, 715. Humbert I., 1335, 1423. Humbert Societies, 558, 115.
Humbert I., 1335, 1423.
Humbertsburg, Treaty of, 2595.
Humboldt, Friederich, 1336, 1114, 1130.
Humboldt River, 1336; Lake, 1930.
Hume, David, 1336, 920.
Hume, Fergus, 1337.
Humidity. See Rain, 2368.
Humming Bird, 1337.
Humor, 407, 962, 1319.
Humperdinck, Englebert, 1337.
Humphrey, H., 2901.
Humphreys, Andrew Atkinson, 1338.
Humphreys, West H., 1371.
Hundred, 1338; sheriff, 2612.
Hundred Days, 1338.
Hundred Years' War, 1338.
Hungarian Millet, 1789. Hungarian Millet, 1789. Hungary, 1338; Huns, 181, 1340; Magyars, 1339, 1000; Austria-Hungary, 193, 950; wars with Turkey, 944, 1339, 1343, 1817; literature, 196, 1520; language, 1339, 2936. Hungerford, Margaret Wolfe, 1340. Hunkers, 233.
Hunneric, 3018.
Huns, or Hungarians, 1340, 195, 1826.
Hunt, Helen. See Jackson, Helen, 1429.
Hunt, James Henry Leigh, 1340, 920, 3240.
Hunt, Mary Hannah, 1340.
Hunt, Bickard Morrie, 1241. Hunt, Richard Morris, 1341. Hunt, Richard Morris, 1341.

Hunt, William G., 668.

Hunt, William Holman, 1341, 2303.

Hunt, William Morris, 1341.

Hunter, David, 1341.

Hunter, John, 1341, 2781.

Hunter, Robert Mercer Taliaferro, 1341.

Hunting. See Game, 1093. Huntingdon, Pa., 1342. Huntington, Ind., 1342. Huntington, N. Y., 1342. Huntington, W. Va., 1342, 3130. Huntington, Daniel, 1342.

Huntington, Frederick Dan, 1342. Huntington, Samuel, 2995. Huntley, Ezekiel, 2633. Huntsville, Ala., 1342, 47. Hunyady, János, 1343, 1736. Huron, Lake, 1343, 1533. Huron Indians, 1343, 1412. Hurricane. See Storms, 2752. Hurst, John Fletcher, 1343. Husband and Wife, 1343, 807, 1714. Huss, John, 1344, 1292, 2389, 2632. Hussites, 1344, 1339, 2300, 3222. Hussite War, 195, 2632. Hutchinson, Kans., 1344. Hutchinson, Charles L., 486. Hutchinson, Thomas, 1345. Hutton Tames, 1114. Hurricane. See Storms, 2752. Hutton, James, 1114. Hutton, Laurence, 1345. Huxley, Thomas Henry, 1345, 920, 2950. Huygens, Constantyn, 1927. Huygens, Constantyn, 1927.
Huysmans, Joris Karl, 1345.
Hyacinth, 1346, 1021.
Hyacinthe, Pere. See Loyson, 1641.
Hyatt, Alpheus, 1346.
Hybrid, 1346, 168, 1226.
Hyde, Douglas, 1346, 1407.
Hyde Park, London, 1347, 1621.
Hyde Park, Mass., 1347.
Hyderabad, or Haidarabad, India, 1347, 844.
Hyder Ali, 1347, 2882.
Hydra, 1347, 1291. Hydra, 1347, 1291. Hydra, Island, 1347. Hydra, Island, 1547. Hydra, or Hydroid, 1347; polyp, 2265. Hydrangea, 1348; saxifrage, 2542. Hydraulic Engine, 1348. Hydraulics, 1348. Hydraulics, 1348. Hydraulics, 1348. Hydrocarbon, 1349, 479, 2074. Hydrochloric Acid, 1349, 15, 2503. Hydrocyamic Acid, 15. Hydrofluoric Acid, 1349. Hydrogen, 1349, 547, 898, 3099. Hydrogen Dioxide, 1350. Hydrography, 1350, 2782; engineering, 916. Hydroids, 1347, 2265. Hydrometer, 1350, 2543. Hydrophobia. or Rabies, 1350, 2119. Hydrophobia, or Rabies, 1350, 2119. Hydrostatic Press, 1350, 1351. Hydrostatics, 1350. Hydrostatics, 1550. Hydrotheraphy, or Water Cure, 1351, 1514. Hyena, 1351, 32, 469. Hygeia, or Hygieia, 1351. Hygiene, 1351, 1274, 1749, 2206, 3082. Hygrometer, 1353. Hyksos, 1353. Hymen, 1353. Hymnology, 1353, 798, 1122, 1276, 2087, 2659, 2720, 2896, 3106, 3122.

Hymns, National. See National Hymns, 1903. Hypatia, 1354. Hyperbole, 997. Hyperion, 1354, 901. Hyperion (satellite), 2535, 2536. Hypnotism, 1354, 1764. Hypodermic Injection, 1354. Hypothesis, 1354. Hyrax, 1354; klipdas, 1354. Hyrcanus, John, 1656, 2512, 2520. Hyssop, 1354; aroma, 153. Hysteria, 1354, 1548.

T

1, 1355, 1427, 2198, 2951. Iambus, 1028. Ian Maclaren, 3105. Ibadan, Africa, 1355.
Ibagué, Colombia, 1355.
Ibajay, Philippines, 1355.
Ibarra, Ecuador, 1355.
Iberia, 1355; Iberians, 920, 1407.
Iberian Peninsula, 1139.
Iberian Peninsula, 1139. Iberville, Pierre, Sieur d', 1355, 1636. Ibex, 1355, 1155. Ibicui, or Ibicuy Guassu, River, 1356. Ibis, 1356; sacred ibis, 1356. Ibn Roshd, 126. Ibrahim Pasha, 1356, 1750. Ibrahim Pasha, Lake, 1976. Ibsen, Henrik, 1356, 826, 1999. Ibsen, Henrik, 1356, 826, 1999.
Ibycus, 1357.
Iça, or Putumayo, River, 1357.
"I came, I saw, I conquered," 430, 3220.
Icarus, 740; Icarian Sea, 740.
Ice, 1357; avalanche, 198; freezing, 1064; hail, 1232; skates, 2645; snow, 2665.
Iceberg, 1358, 1112, 1146.
Ice-Cutting Tools, 1357.
Iceland, 1358, 868, 1135, 1890.
Iceland Moss, 1359, 1859.
Iceland Spar, 1359, 1794, 2252,
Ice Machines, 1357.
Ice Plant, 1359. Ice Plant, 1359 Ichneumon, 1359, 1827. Ichneumon Fly, 1359. Ichnology, 1359; fossils, 1039. Ichthyology, 1359, 1004, 3225. Ichthyosaurus, 1360, 1115. Iconoclast, 1360; iconolatry, 1363. Ictinus, 1360. Ictinus, 1360.
Ida, Mountain, 1360, 2108.
Idaho, 1360, 1021, 2663, 2978.
Idaho, University of, 1362.
Iddesleigh, Stafford, Earl of, 1363.
Ide, Henry C., 2192.
Idea, 1363, 120, 1399. Idealism, 1363, 2196; Berkeley, 280. Idealism, 1363, 430, 1982. Idiot, 1363, 984, 1392. Idol, 1363, 202, 740, 1385, 1432. Idumaea, 872; Esau, 935. Idun, 1364 Idun, 1364.
Idyl, or Idyll, 1364; poetry, 2245.
Ignatieff, Nicholas Paulovitch, 1364.
Ignatius, Saint, 1364, 1971, 2200.
Igneous, 1364, 1115, 2913.
Ignis Fatuus, 1364.
Igorrote, 1364, 2191.
Iguana, 1364, 1612.
Iguanodon, 1364, 800.
Ik Marvel, 1814, 2327.
Iliad, 1194, 1315, 2925.
Ilion, 1365.
Ilium. or Troy, 2925. Ilium, or Troy, 2925.
Illimani, Mount, 1365, 327.
Illinois, 1365, 2978.
Illinois, University of, 1368, 2997.
Illinois and Michigan Canal, 1368. Illinois Indians, 1368, Illinois River, 1368, 553. Illinois Wesleyan University, 316. Illiteracy, 1368; education, 874.

Illusion. See Eye, 961. Illyricum, or Illyria, 1368, 2870. Iloilo, Philippines, 1369, 2191. Imagination, 1369, 975. Imam, or Iman, 1369, 1858. Imam, or Iman, 1309, 1638.
Imandra, 1543.
Imbecility, 983, 1363.
Immaculate Conception, 979, 1720.
Immigration, 1369, 191, 911.
Immortality, 1370, 1276.
Immortelles, or Everlasting Flowers, 1370.
Impeachment, 1370, 1463, 2985.
Imperator, 1371, 913.
Imperialism, 1371 Imperialism, 1371.
Impressionist, 1371.
Impressment, 1371, 1905.
Imus, Philippines, 1371.
Inagua, Great and Little, 1371, 210.
Inca, 1371, 98, 174, 733, 2229.
Incandescent Light, 893.
Incarnation, 1372; Brahmanism, 357, 3057.
Incense, 1372, 1054.
Inclined Plane, 1372, 1746, 2567.
Income Tax, 1372, 571, 2161, 2826, 2991.
Incubation, 879, 910.
Incubator, 1372, 2298.
Incubus, 1373, 1975; Seccuba, 1373.
Independence, Declaration of, 769, 2993.
Independence, Iowa, 1373. Imperialism, 1371 Independence, Declaration of, 769, 2993.
Independence, Iowa, 1373, 1490.
Independence, Kans., 1373, 1850.
Independence Day, 1373, 1311.
Independence Hall, 1373, 2182.
Independent Order Free Sons of Israel, 274.
Independents, 1373, 652. Independents, 1373, 652.

Index Librorum Prohibitorum, 1373.

India, 1373; Bengal, 274; Hindustan, 1303; Punjab, 2336; Cobra, 612; East India Company, 860; Madras, 1671; mythology, 1885; mutiny, 514, 1377; national emblem, 1020; schools, 1376; governors, 604, 730, 1377; Mahrattas, 1678; literature, 1377, 2523; suttee, 2783; Sepoy, 2588; religion, 357, 2394; Thugs, 2872; railroads, 1375.

India Hemp. 2246. railroads, 1540.
India Hemp, 2246.
India Ink, 1378; ink, 1389.
Indiana, 1378, 1021, 2978.
Indianapolis, Ind., 1380, 2974.
Indianapolis, Archipelago. See Malay Archipela Go, 1683, Indiana University, 1381, 316. Indian Corn. See Corn, 678. Indian Cress, 1900. Indian Famine, 974, 1377. Indian Hemp, 812. Indian Mallow, or Stamp Weed, 1381. Indian Mutiny, 1377. Indian Ocean, 1381, 2571, 3160. Indianola, Iowa, 1381. Indian Reservations, 1381, 1383. Indian River, 1381. Indian River, 1561.
Indians, American, 1382, 116, 127, 201, 305, 505, 557, 571, 637, 701, 776, 1044, 1343, 1368, 1403, 1412, 1505, 1513, 1519, 1730, 1776, 1813, 1819, 1898, 2025, 2035, 2059, 2066, 2128, 2156, 2294, 2330, 2482, 2584, 2620, 2642, 2832, 2958, 3163, 3007, 3190. Indian Summer, 1383. Indian Territory, 1383, 2028. India Rubber, or Caoutchouc, 1383, 467, 1164, Indigirka River, 1384, 2625.

Indigo, 1384, 2081; dyeing, 849. Indigo Bird, 1384; finch, 999. Indigofera Tinctoria, 1384. Indium, 1384, 547. Indo China, 1384; Anam 94; Laos, 1542; Siam, 2623 Indo-European, 1385, 159, 500, 950, 1540, 2195. Indra, 1385. Indra, 1385.
Induction, 1385, 1619.
Induction (electricity), 1385, 891, 2835.
Induction Coil, 1385, 2909.
Inductive Method. See Deductive Метнор, 770.
Indulgence, 1386, 1570, 1647, 2389.
Indus River, 1386, 779.
Industrial School, 1386, 873, 2316.
Inertia, 1386, 849; inertia governor, 1173.
Infallibility (papal), 2228, 2273, 3023.
Infant, 1386, 2383; guardian, 1212; marriage, 1714. Infantry, 1387, 150, 247, 477, 2806, 3225. Infinite, 1387; finite, 1387. Inflection, 1387, 1129. Inflorescence, 1387, 1020. Influenza, or Grippe, 1387, 927. Infusoria, 1387, 2322, 3064. Ingalls, John James, 1387. Ingalls, Melville Ezra, 1387. Ingails, Meiville Ezra, 1384. Ingelow, Jean, 1388, 3244. Ingemann, Bernhard, 783. Ingersoll, Ontario, 1388. Ingersoll, Jared, 1388, 2989. Ingersoll, Robert Green, 1388, 308, 3242. Ingiald, 2788. Ingraham, Duncan Nathaniel, 1388. Ingram, Arthur Foley Winnington, 1388. Inheritance Tax, 1388; tax, 2836. Inheritance Tax, 1388; tax, 2836. Inia, 1389; dolphin, 813. Initiative. See Referendum, 2388. Injunction, 1389, 2005, 3187. Ink, 1389, 1373, 1607, 2144. Inkermann, Battle of, 1389, 705. Inkermann, Russia, 1389. Inman, Henry, 1389. Inmoss, George, 1390. Innocent, 1390, 2273. Innocent I., 1390, 2273. Innocent I., 1390, 2273. Innocent II., 1390. Innocent IÍ., 1390.
Innocent III., 1390, 815, 1052.
Innocent IV., 1390.
Innocent V., 1390.
Innocent VI., 1390, 2419.
Innocent VII., 1390, 2419.
Innocent VIII., 1390, 60, 3171.
Innocent IX., 1390.
Innocent X., 1390.
Innocent XI., 1390.
Innocent XII., 1390.
Innocent XIII., 1390.
Innocent XIII., 1390.
Innocent XIII., 1390.
Innocents' Day, 1390.
Inn River, 1390. Innocents' Day, 1390.
Inn River, 1390.
Innsbruck, Austria, 1390, 194.
Inns of Chancery, 1391.
Inns of Courts, 1391; barrister, 1391.
Inoculation, 1391, 1350; vaccination, 3009.
Inquisition, 1391, 196, 1087, 2697, 2900.
Insane Asylum, 1391; feeble-minded, 983.
Insanity, 1392, 984, 1645; kleptomania, 1514.
Insecticide, 1392; insects, 1393.
Insectivora. 1392. Insectivora, 1392.
Insectivorous Animals. 1, 110, 869, 1277, 1820.
Insectivorous Plants, 2223, 3030.
Insects, 1393, 803; ant, 108; bee, 258; fly, 1022;
Iris (mythology), 1409, 901.

spider, 2707; wasp, 3098; entomology, 925, Insessores, 1394, 298. Insessores, 1394, 296.
Insomnia, or Sleeplessness, 1394.
Inspiration, 1394; (physiology), 2400.
Instinct, 1394, 2383.
Institute, 1394; teachers', 2830.
Institute of France, 1394, 2414.
Institutional Church, 1395.
Instrumental Music, 1395, 2052, 2208, 3051.
Instrumental Music, 1395, 2052, 2208, 3051. Instrumental Music, 1395, 2052, 2208, 30 Insulator, 1395, 890. Insurance, 1395, 108, 273, 380. Integument, or Coat, 2579. Intellect, 1396, 1793, 2328. Intercollegiate Athletic Association, 177. Interest, 1396; usury, 3004. Interest, 1396, 181. Interior, Department of the, 425, 2991. Interlaken, Switzerland, 1397. Intermezzo, 1397. International Copyright, 671. International Date Line, 1397.
International Law, 1397, 1551, 2916.
International Lesson Leaf, 1475.
International Peace Conference, 1398, 1231.
Interrogation Point, 2336. Interstate Commerce, 1398, 1028. Intestines, 1398, 95, 2208. Intoxication, 1398, 777. Intuition, 1399, 2328. Inverness, Scotland, 1399. Invertebrata, 1399, 105, 1115. Involution and Evolution, 1399, 2299. Io, or Isis, 1399, 2060; satellite, 1479, 2535. Iodine, 1399, 547, 571. Iodoform, 1399. Iola, Kans., 1400, 1904. Iolcos, 138. Iona, Island, 1400. Ionia, 1400, 1195, 1786. Ionia, Mich. 1400 Ionia, Mich., 1400. Ionian Islands, 1400, 675. Ionian Islands, 1400, 675.
Ionians, 874, 1195.
Ionian Sea, 1400, 1192.
Ionic Order, 1400, 132, 637.
Iowa, 1400, 1768, 1021, 2978.
Iowa, State University of, 1403.
Iowa College, 1403.
Iowa Idea, The, 725. Iowa Idea, The, 729.
Iowa Indians, 1403, 742.
Iowa River, 1404, 1401.
Iowa State College, 1404.
Ipecacuanha, 1404, 1669.
Iphigenia, 1404, 34, 2052.
Ipswich, England, 1404.
Isowich, Mcc. 1404. Ipswich, Mass., 1404. Iquique, Chile, 1404, 560. Iran, 1404, 2163. Iran, 1404, 2163.
Iranians, or Persians, 1404, 2164.
Irawadi. See Irrawaddy, 1413.
Ireland, 1405, 1186; Celts, 518; Fenians, 986; home rule, 1316; language, 1407; national emblem, 1020; Saint Patrick, 2123; wars with England, 1407, 3152.
Ireland, John, 1408.
Irenaeus, Saint, 1408, 2262 Irenaeus, Saint, 1408, 2263. Irene, of Byzantine, 1408, 423.

Iris (physiology), 1409, 124, 962. Irish Catholic Benevolent Union, 274. Irish Eik, 905. Irish Lik, 309.

Irish Land Act, 1408, 3046.

Irish Language, 1406, 1407.

Irish Moss, or Carrageen, 1409, 1859.

Irish Rebellion, 1117, 1407.

Irish Sea, 1409, 1186, 1405. Irish Sea, 1409, 1186, 1405.
Irish Wake, 3070.
Iritis. See IRIS, 1409.
Irkutsk, Siberia, 1409, 211.
Iron, 1409; blast furnace, 310; cast, 1410, 2736; wrought, 1410; loadstone, 1612; pyrites, 2340; rust, 2477; specific gravity, 2702.
Iron Age, 1411, 35.
Iron Chancellor, 301.
Ironclad Vessels, 1411; armor plate, 148.
Iron Cross, 1411 Iron Cross, 1411. Iron Crown, 1411. Iron Gate, 1412, 752. Iron Mask, The Man with the, 1412. Iron Mountain, Mich., 1412. Iron Mountain, or Iron Mount, 1412, 1283, 1811. Ironsides, Cromwell's, 661, 710, 2463. Ironton, Ohio, 1412. Ironwood, 1412, 1323. Ironwood, Mich., 1412, 1780. Irony, 997. Iroquoian Indian, 1412, 1382. Iroquoias, or Six Nations, 1412. Irrawaddy, or Irawadi River, 1413, 410. Irrigation, 1413, 39, 882, 1947. Irritability (vegetable), 2588. Irtish, or Irtysh River, 1414, 2014. Irving, Sir Henry, 1414. Irving, Washington, 1414, 86, 1239, 2327. Irving, Washington, 1414, 86, 1239, 232 Irvington, N. J., 1415. Isaac, 1415, 8, 1431. Isabella, of England, 877. Isabella I., of Spain, 1415, 636, 987. Isabella II., 1415, 988, 2698. Isaiah, 1416, 289, 2320. Ischia, Island, 1416, 1893. Isengrim the Wolf, 2404. Ishbosheth, 7, 758, 1141. Ishmael, 1416, 8. Ishmaelites, 1416. Ishmael, 1416, 8.
Ishmaelites, 1416.
Ishpeming, Mich., 1416.
Isinglass (mica), 1416; mica, 1776.
Isinglass, 1416, 616.
Isis, 1416, 117, 2184.
Islam, 1416, 5, 1819.
Island, 1417; archipelago, 132.
Island Number Ten, 1417, 2274.
Islands of the Blessed, 1417. Island Number Ten, 1417, 2274.
Islands of the Blessed, 1417.
Islands of the Pacific, 1417, 2077.
Islay, Island, 1417.
Isle of France, 1417, 1738.
Isle of Pines. See Pines, Isle of, 2218.
Isle Royale, 1417, 2780.
Isles of Shoals, 1417.
Ismail Pasha, 1417, 1166, 1505.
Isobars, or Isobarometric Lines, 1418.
Isocrates, 1418, 1571, 2047. Isocrates, 1418, 1571, 2047. Isocrates, 1418, 1571, 2047. Isothermal Lines, 1418, 603. Ispahan, Persia, 1418, 2164. Israelites. See Jews, 1455, 805. Israëls, Josef, 1418. Issus, Battle of, 62, 754. Isthmian Games, 1418, 676, 1093, 1790. Isthmus, 1418, 676. Isthmus of Panama, 2093, 1418.

Istria, 1418, 195.
Istria, Dora D', 817.
Itagaki, Taisüke, 1419.
Italy, 1419; agriculture, 1420; bank of Venice, 225; colonies, 1421; debt, 767; language, 1421; literature, 750, 1421; national emblem, 1020; navy, 1421, 1911; newspapers, 1473; opera, 2041; railroads, 1420; religion, 1421; universities, 1421, 2997; wars, 1058, 1097, 1131, 1894, 3042.
Itch, 1423; mite, 1814.
Itenez, 1211.
Ithaca, Island, 1424, 1400.
Ithaca, N. Y., 1424.
Ito, Hirobumi, Marquis, 1424.
Iturbide, Don Agustin, 1424, 1775, 2524.
Iuka, Battle of, 2451.
Ivan, 1424, 2471.
Ivan II., of Moscow, 1424, 2471.
Ivan IV., of Russia, 1425, 2471.
Ivan IV., of Russia, 1425, 2471.
Ivanhoe, 920, 2566.
Ives, Frederic E., 924.
Ivory, 1425, 898, 3027.
Ivory, Vegetable. See Ivory Palm, 1425.
Ivory Coast, 1425, 33, 1047.
Ivory Palm, 1425.
Ivy, 1425, 1021; American, 3057; poison, 2774.
Ixcaquixtla, Mexico, 1426.
Ixion, 1426; wheel of, 2057.
Ixtapalapa, Mexico, 1426.
Izard, George, 1426.
Izard, George, 1426.
Izard, George, 1426.
Iztaccihuatl, 1426, 1773.
Izúcar, Mexico, 1426.

J

J, 1427, 1355, 2951.
Jabiru, 1427; stork, 2751.
Jacana, 1427.
Jack, 1427; screw jack, 1427, 2567.
Jack, Captain, 460, 1817.
Jackal, 1427, 3174.
Jackadaw, 1427, 2361.
Jack-in-the-pulpit, 1428, 3070.
Jack-o'-Lantern, 1364.
Jack Rabbit, 1428, 1252.
Jack-screws, 2567.
Jackson, Mich., 1428, 1780.
Jackson, Miss., 1428, 2978.
Jackson, Ohio, 1428.
Jackson, Tenn., 1428, 2844.
Jackson, Andrew, 1428, 2005, 2976.
Jackson, Helen Fiske Hunt, 1429, 89, 2327.
Jackson, Thomas Jonathan, 1430, 403, 590.
Jackson, William, 2989.
Jackson, William, 2989.
Jacksonville, Fla., 1430, 1018.
Jackstones, 1430.
Jackstones, 1430.
Jacob, 1431, 1168, 1451, 1455.
Jacobi, Abraham, 1431.
Jacobins, 1431, 1703, 2429.
Jacobites, 1431, 2394, 2762.
Jacobites, 1431, 2394, 2762.
Jacobites, 1431.
Jacob Tome Institute, 1431.
Jacotot, Jean Joseph, 1431.

Jacquard, Joseph Marie, 1432. Jacquerie, Insurrection of the, 1432. Jacquerie, Insurrection of the, 1432.
Jade, 1432, 1921; hornblende, 1432.
Jadwin, Edgar, 1432.
Jaffa. See Joppa, 1470.
Jagannath, or Juggernaut, 1432; Krishna, 1522.
Jaguar, 1432, 502, 2068.
Jahn, Friedrich Ludwig, 1433.
Jaipur, or Jeypore, India, 1433, 1377.
Jalandhar, or Jullundur, India, 1433.
Jalap, 1433.
Jalap, 1433.
Jalapa, or Xalapa. Mexico, 1433, 1775. Jalapa, or Xalapa, Mexico, 1433, 1775.

Jamaica, Island, 1433, 1713, 3127.

Jamaica, N. Y., 1434.

Jamaica Pepper, 74.

Jamaica Rum, 2460.

James River, 1434, 1436.

James, Or Dakota River, 1434, 2690.

James, Saint, The Greater, 1434, 119.

James, Saint, The Less, 1434, 289.

James II., of England, 1434, 288, 922, 2565.

James II., of England, 1435, 107, 2565.

James III., of Scotland, 1435, 2564.

James IV., of Scotland, 1435, 2564.

James IV., of Scotland, 1435, 2564.

James VI., of Scotland, 1435, 2564.

James VI., of Scotland, 1435, 2565.

James VII., of Scotland, 1435, 2565.

James, Henry, 1435, 89, 1606, 2004.

James, Jesse W., 1435, 373.

James, Henry, 1436, 1332.

James, William, 1436.

James Bay, 1436, 1332.

Jameson, Leander Starr, 1436, 1243, 2680.

Jamestown, N. D., 1436, 1994.

Jamestown, N. D., 1436, 1994.

Jamestown, Va., 1436, 1169, 2979.

Jamestown, Va., 1436, 1169, 2979.

Jamestown, Va., 1437, 3169.

Janesville, Wis., 1437, 3169.

Janeway, Edward Gamaliel, 1437.

Janizaries, 1437, 2593, 2944.

Jansen, Zacharias, 1782.

Jansenists, 2118.

January, 1437, 1839. Jalapa, or Xalapa, Mexico, 1433, 1775. Jamaica, Island, 1433, 1713, 3127. Jansen, Zacharias, 1782. Jansenists, 2118. January, 1437, 1839. Janus, 1437, 1839. Japan, 1437, 674; army, 1440; Formosa, 1034; libraries, 1440; language, 1441, 1540; national emblem, 1020; navy, 1440, 1911; race, 1826; religion, 396, 1441; universities, 1440, 2890, Japan Current, 1524, 452. Japan Current, 1524, 452. Japanese-British Alliance, 1442. Japanese Wax, 3108. Japanning, 1443; enamel, 914. Japheth, 1443, 159. Japurá, or Yapurá River, 1443, 80. Jarnac, Battle of, 1443, 1334. Jasmine, 1443. Jason, 1443, 138, 502, 1746. Jasper, 1444, 1281, 2750, 2903. Jasper, William, 1444. Jassy or Yassy, Rumania, 1444, 2462. Jászberény, Hungary, 1444. Jats, 1444; Sanskrit, 2523. Jaundice, or Icterus, 1444, 1609. Java, Island, 1444; Java coffre, 619. Jaxartes River, 2881, 3008. Jay, 1445, 714. Jay, John, 1445, 1549, 2651.

Jayhawker, 1446. Jay Treaty, 1446, 128, 1242, 3197. Jeannette, Pa., 1446. Jeannette Expedition, 777. Jean Paul, 2327, 2416. Jebelesh-Sheikh, Mount, 1293, 1557. Jebel Jermuk, Mount, 2084. Jebusites, 2084.
Jebusites, 2084.
Jefferies, Richard, 1446.
Jefferson, Joseph, 1446, 1497.
Jefferson, Thomas, 1446, 85, 1637, 2976, 2995.
Jefferson Barracks, Mo., 1180.
Jefferson City, Mo., 1447, 2978.
Jeffersonville, Ind., 1447.
Jeffrey, Francis, 871 Jeffrey, Francis, 871. Jeffreys, George, 1447. Jehel Ayashi, Mount, 179. Jehoiakim, 1449. Jehoshaphat, 1448, 159. Jehovah, 1448, 901, 1156, 1453. Jehu, 1448, 1458. Jelly, 1448, 1212. Jellyfish, 1448, 618, 1750. Jemappes, Belgium, 1448. Jemappes, Belgium, 1448. Jena, Battles of, 1448, 1541, 1895. Jena, Germany, 1448, 1125. Jena, University of, 1448. enkins, Edward, 1448. lenkins, G. Fellows, 558. Jenks, Jeremiah Whipple, 1449. Jenner, Edward, 1449, 1391, 3009. Jephthah, 1449, 1449, 1772, 1984. Jerboa, or Gerboa, 1449, 772, 1864. Jeremiah, 1449, 289, 2320. Jerez de la Frontera, or Xerez, Spain, 1450. Jericho, Palestine, 1450, 903; Plains of, 2084. Jericho, Rose of, 1450. Jeroboam I., 1450, 1456, 2618. Jeroboam II., 1450, 1456, 2618. Jerome, Jerome Klapka, 1450. Jerome, Saint, 1450, 2446. Jerome, William Travers, 1450. Jerome of Prague, 1451. Jerome of Prague, 1451.
Jersey, Island, 1451, 532.
Jersey Blue State, 1943.
Jersey City, N. J., 1451, 2974.
Jerusalem, Palestine, 1451, 2084, 2943; conquest, 204, 2886; Church of the Holy Sepulcher, 1452; Crusades, 716, 214, 1058, 1631, 2502; Mount Moriah, 1848; Mount of Olives, 2032; Mount Zion, 3221; rebuilding, 1451; Solomon's Temple, 1451, 1848; walls of, 1452; Zioniets, 3221 mon's Temple, 1451, 1848; walls of, 1452; Zionists, 3221.

Jerusalem Delivered, 1157, 2824.

Jervis, Sir John, 472.

Jester. See Court Fool, 689.

Jesuits, or Society of Jesus, 1452, 599, 1641, 2126, 3194; expulsion of, 1453, 2796; missions, 1780, 3169.

Jesus Christ 1453, 286; Christianity, 575, 716. Jesus Christ, 1453, 286; Christianity, 575, 716; God 1156; teachings of, 874. Jet, 1454; lignite, 1590. Jethro, 1784. Jetty, 1454, 852, 1808. Jevons, William Stanley, 1454. Jew, The Wandering, 3079. Jewelry, 1454; precious stones, 2750. Jewett, Sarah Orne, 1454. Jewfish, 1454. Jews, 1455, 205, 1304, 1451, 2084; fasts, 979; festivals, 938, 991, 2119; literature, 287, 1457, 1472, 2193; Maccabees, 1656; Pharisees, 2179;

religion, 2394; return of, 737, 2084; Sadducees, 2482; Sanhedrim, 2520; Scribe, 2568; suppression, 877, 987, 1457, 2471; tabernacle, 2803; taxation, 2826; writing, 3188; Yiddish, 3207; Zionists, 3221. Jew's-Harp, 1458. Jeypore. See JAIPUR, 1433. Jezebel, 1458, 41, 901, 1448. Jezreel, Plain of, 935. Jhelam, or Jhelum River, 1458. Jigger, or Chigoe, 1458. Jingoism, 1458. Jingisisha, 1458, 491. Jinrikisha, 1458, 491. Jiquilisco Bay, 2510. Jitomir, or Zhitomir, Russia, 1458. Joab, 1458, 8, 759. Joach 1438, 8, 739.
Joachim, Joseph, 1459.
Joachimsthaler, 2854.
Joan of Arc, 1459, 537, 2055, 2455.
Joash, or Jehoash, 1459.
Job, 1459, 289, 825, 3008, 3243.
Job's Tears, 1460, 577.
Jocasta, 2020; Jodelle, Etienne, 1048.
Joel, 1460, 289, 2320.
Joffre, Joseph, 1460.
Johannesburg, South Africa, 1460, 2912.
John, popes of Rome, 1460, 2273.
John, Lackland, 1460, 922, 1480, 2185.
John II., of Poland, 1460.
John III., John Sobieski, 1460, 2943.
John II., of Portugal, 1461.
John IV., of Portugal, 1356.
John VI., of Portugal, 356.
John VI., of France, 2247, 3014.
John, Saint, 1461, 119, 288.
John Dory, 1461.
John George I., of Saxony, 1461.
John George I., of Saxony, 1461, 2543.
Johnnies, 3201. Joachim, Joseph, 1459. Joachimsthaler, 2854. Johnnies, 3201. Johnnycake, 84. Johnnycake, 64.
Johnny-go-to-bed, 2728.
John of Anjou, 988.
John of Austria, Don, 1462, 2186.
John of Beverley, 257.
John of Gaunt, 1462, 2413.
Johns Hopkins University, 1462, 220, 2997.
John the Baptist, 1462, 1453.
John the Feerless, Duke of Burgundy, 408 John the Baptist, 1462, 1453.
John the Fearless, Duke of Burgundy, 408.
Johnson, Andrew, 1462, 1371, 2976.
Johnson, Eastman, 1463.
Johnson, E. Pauline, 1463.
Johnson, Herschel Vespasian, 1463.
Johnson, Hiram W., 3280.
Johnson, Sir John, 1464, 1293, 2054.
Johnson, John A., 1464; Johnson, Reverdy, 14 Johnson, Sir John, 1464, 1293, 2054. Johnson, John A., 1464; Johnson, Reverdy, 1464. Johnson, Richard Mentor, 1464, 653, 2976. Johnson, Rossiter, 1464. Johnson, Samuel, 1464, 551, 920, 1482. Johnson, Thomas, 1465. Johnson, Thomas, Lotin, 1465. Johnson, Thomas Loftin, 1465.
Johnson, Sir William, 1465, 360, 1037.
Johnston, William Samuel, 2989.
Johnston, Albert Sidney, 1465, 2615.
Johnston, Sir Harry, 2026.
Johnston, Joseph Eggleston, 1465, 2614.
Johnston, Mary, 1466.
Johnstown, N. Y., 1466.
Johnstown, Pa., 1466, 648.
Johore, 1466.
Johnstown, 489. Joining, 489. Joint, 1466, 495, 1876.

Joint-Firs. 1467; fir, 1001. Joints, 1467; fault, 981. Joint-Stock Company, 1467, 643. Joinville, François, Prince de, 1467. Joints, 1467; fault, 981.

Joint-Stock Company, 1467, 643.

Joinville, François, Prince de, 1467.

Jókai, Maurus, 1467.

Joliet, Ill., 1467, 1367.

Joliet, Louis, 1468, 1367, 1713, 1808.

Joliette, Quebec, 1468.

Joliette, Quebec, 1468.

Joliette, Quebec, 1468.

Jomini, Henri, Baron, 1468.

Jommelli, Nicolò, 1468.

Jommelli, Nicolò, 1468.

Jonah, 1468, 289, 1978.

Jones, Inigo, 1469.

Jones, James Kimbrough, 1469.

Jones, Jenkin Lloyd, 1469.

Jones, Jenkin Lloyd, 1469.

Jones, Jenkin Lloyd, 1469.

Jones, Jenkin Lloyd, 1469.

Jones, Samuel Porter, 1469.

Jones, Samuel Porter, 1469.

Jonson, Benjamin, 1470, 919, 1548, 3255

Joplin, Mo., 1470, 1813.

Joppa, or Jaffa, Palestine, 1470, 1452.

Jordaens, Jacob, 1470.

Jordaens, Jacob, 1470.

Jordan River, 1470, 1086, 2083.

Jordan River, Utah, 1191, 3005.

Jordan, Camille, 1470.

Jordan, David Starr, 1471, 875, 1567.

Jordan, Wilhelm, 1130.

Jorullo Mountain, 1471, 3061.

Joseph (husband of Mary), 1471, 1720.

Joseph II., of Germany, 1471.

Josephus, Flavius, 1472, 639, 1458.

Josen, 232.

Joshua, 1472, 1455, 1858.

Joshua, Book of, 289, 1472, 2154. Joses, 232.
Joshua, 1472, 1455, 1858.
Joshua, Book of, 289, 1472, 2154.
Josiah, 1472, 1456.
Jotuns, 1472; giants, 1136.
Joubert, Barthélemy Catherine, 1472, 1847.
Joubert, Petrus Jacobus, 1472, 2680.
Jouett, James Edward, 1473.
Lourdan, Jean Bantiste, 1473. Jouett, James Edward, 1473.
Jourdan, Jean Baptiste, 1473.
Journalism, 1473, 169, 1196, 1474.
Journalism, School of, 1474.
Juan de Fuca, Strait of, 2332, 3093.
Juan Fernandez, Island, 1474, 2583.
Juarez, Benito Pablo, 1474, 1739, 1775.
Jubilee, 1475; festivals, 991.
Judah, 1475, 1326, 1450, 1456.
Judas, or Jude, 1475; Thaddeus, 119.
Judas Iscariot, 1475, 119, 2771.
Judd, Orange, 1475.
Jude, Epistle of, 1475, 289.
Judea, or Judaea, 1475. Judea, Epistic 61, 1449, 289. Judea, or Judaea, 1475. Judge, 1475; courts, 690, 1481. Judges, Book of, 1476, 289. Judgment, 1476, 2328. Judgment (in law), 180, 663, 2318. Judith, 1476, 118, 289. Judson, Adopiram, 1476 Judson, Adoniram, 1476. Judy, 2335. Judy, 2535.

Juggernaut. See Jagannatha, 1432.

Juggler, 1476; legerdemain, 1563.

Jugular, 1476; vein, 3025.

Jugurtha, 1476, 2771.

Jujube, 1476.

Julep, 1476; mint julep, 1476.

Julia, 2069, 2874.

Julian, of Rome, 1476, 2444.
Julian, George Washington, 1477.
Julian Calender, 436.
Julien, Stanislas (1799-1873), 1048.
Julius (popes), 1477, 2273.
Julius II., Roman Pope, 1477, 102, 2174.
July, 1477, 1839.
July, Column of, 1477.
July Revolution, 1477.
Jumbo, 234.
Jumping Mouse. See Jerboa, 1449.
Juncion City, Kans., 1477.
Junction City, Kans., 1477.
Juneau, 1477, 1839.
Juneau, 1477, 50.
Juneau, Lorent Solomon, 1478.

Juneberry, 1478, 2144.
June Bug, or May Beetle, 1478, 615.
Jungfrau, 1478, 2793.
Junius, 1478, 3236.
Junk, 1478; sail, 2487.
Junius, 1478, 3236.
Junk, 1479, 1399, 1795; asteroid, 171.
Junot, Androche, 1479.
Jupiter, or Jove, 1479, 2440, 3219.
Jupiter, or Jove, 1479, 2440, 3219.
Jupiter, 1479, 174, 2231, 2534.
Jura Mountains, 1480, 2793.
Jurassic, 1480, 1115.
Juruá River, 1480, 80.
Jury, 1480, 2988.
Jussieu, Bernard, 347.
Justice, Department of, 425, 2991.
Justice of the Peace, 1481, 690, 2254.
Justification, 1481, 2145.
Justinian I., 1481, 423.
Jute, 1481, 993.
Jutes, 1482, 783, 920.
Jutland, 1482, 781.
Juvenal, Decimus, 1482, 2445.
Juvenile Court, 534; juveniles, 2390.

K

K, 1483, 424, 2951.
Kaaba, or Caaba, 1483, 8, 1234, 1746.
Kabul, or Cabul, 1483, 28.
Kabyles, 68, 1243, 3225.
Kadesh Barnea, 1483, 1805, 1892.
Kadiak, Island, 1483.
Kafir Corn, 1483, 1489.
Kafiristan, 1484.
Kafirs, or Kaffirs, 1484, 470, 3226.
Kagóshima, Japan, 1484.
Kahoolawe, Island, 1265.
Kai Kobad, 1747, 2583.
Kailas Mountain, 1484.
Kaiser, 1484, 429, 1128, 1824.
Kaiser Wilhelm Canal, 1484, 220.
Kaiser Wilhelm's Land, 1127, 1940.
Kaiserslautern, Germany, 1484.
Kalahari Desert, 1485, 31, 1967.
Kalakaua, 1267, 1591.
Kalamazoo, Mich., 1485, 1780.
Kalamazoo River, 1485, 1778.
Kalb, John, Baron de, 773.
Kaleidoscope, 1485, 369.
Kalevala, 1297, 1298.
Kali, 1485; Siva, 2644.

Kalispel, or Pend d'Oreille, 1485. Kalispel, Mont., 2936. Kalk, Germany, 1485. Kalmia, 1485. Kalmucks, or Calmucks, 1485, 182, 1826. Kama River, 1486, 3061. Kâma, or Kâmâdêva, 1486. Kamchatka, or Kamtchatka, 1486, 2026. Kamchatka, or Kamtchatka, 1486, 2026. Kamehameha I., 1486, 1267. Kamchameha II., 1486, 1267. Kamehameha III., 1486, 1267. Kamehameha IV., 1486, 1267. Kamehameha V., 1486, 1267. Kamel, G. J., 446. Kamerun, or Cameroon, 1486, 33, 1127. Kampuhisen, Dirk, 1927. Kanaka, 1487; coolies, 1487. Kanawha Canal, 1580. Kanawha River, 3129. Kanazawa, Japan, 1487. Kandahar, or Candahar, Afghanistan, 1487, 28. Kandalasksha, Gulf of, 3142. Kandy, Ceylon, 1487, 525. Kane, Pa., 1487. Kane, Elisha Kent, 1487. Kangaroo, 1487, 1717; rat, 1488. Kangaroo Island, 1488. Kangaroo Rats, 1717. Kankakee, Ill., 1488, 1367. Kankakee River, 1488, 1365. Kansas, 1488, 2978; flower, 1021. Kansas, 1488, 2978; flower, 1021. Kansas, University of, 1491, 1552. Kansas City, Kans., 1491, 1490. Kansas City, Mo., 1491, 1744, 2975. Kansas Indians, 742. Kansas-Nebraska Bill, 1492, 820, 1491, 1914, 2399. Kansas River, 1492, 1489. Kansas State Normal School, 1492, 1490. Kant, Immanuel, 1492, 28, 875, 1129, 2196. Kaolin, 1493, 596, 985, 2296. Karakorum Mountains, 1493. Karamzin, Nicholas Michaelovitch, 1493. Kara Sea, 162, 2003. Karikal, 1493. Karikal, 1493. Karlsbad. See Carlsbad, 484, 247. Karlsruhe. See Carlsruhe, 484. Karnak, Temple of, 2857. Karr, Alphonse, 2004. Kaschau, or Kassa, Hungary, 1493. Kashan, Persia, 1493. Kashan, Persia, 1493.
Kashan, Persia, 1493.
Kashmir. See Cashmere, 497.
Kaskaskia, Ill., 1367, 1494, 1713.
Kaskaskia, Ill., 1367, 1494, 1365.
Kasson, John Adams, 1494.
Katahdin, or Ktaadn, Mount, 1494, 1679.
Katrine, Loch, 1494.
Kattegat. See Cattegat, 511.
Katydid, 1494; grasshopper, 1182.
Kauai, Island, 1265.
Kauafman, Angelica, 1494.
Kaukauna, Wis., 1494.
Kaukauna, Wis., 1494.
Kaunitz, Wenzel Anton, 1494.
Kaw, or Kansa, 1495, 2268.
Kayles, 68, 278.
Kazan, Russia, 1495, 1486.
Kazan, University of, 1495, 2997.
Kean, Charles John, 1495.
Kean, Edmund, 1495. Kean, Edmund, 1495. Kearney, Neb., 1495, 1914. Kearny, N. J., 1495.

Kearny, Lawrence, 1495. Kearny, Philip, 1495, 532, 1932. Kearny, Stephen W., 1496. Kearsarge, 1496, 47, 591. Keating, Geoffrey, 1407. Keats, John, 1496, 920, 1340, 3234, 3246, 3247. Keble, John, 1496, 1353. Kecskemét, Hungary, 1496. Kedron, Brook, 2033. Keefer, Thomas Coltrin, 1496. Keel. 1496: ship. 2616. Keel, 1496; ship, 2616. Keeley, Leslie E., 1496; Keeley institutes, 1496. Keene, N. H., 1497, 1942. Keene, Laura, 1497. Keewatin, 1497, 458. Keewatin, 1497, 458.
Keiser, Reinhard, 2041.
Kelat, Baluchistan, 222.
Keller, Gottfried, 1130.
Keller, Helen Adams, 1497.
Kellermann, François Christophe, 1497.
Kellermann, François Christophe, 1497.
Kellogg, Clara Louise, 1497.
Kellogg, Samuel Henry, 1498.
Kelly, John, 2813.
Kelly, William, 1498.
Kelp, 1498, 1399.
Kelpies, 969. Kelpies, 969. Kelts, or Celts, 518, 1406, 2697. Kelvin, Lord. See Thomson, Sir William, 2868. Kelvin, Lord. See Thomson, Sir William, 28 Kemble, Frances Anne, 1498. Kemble, John Philip, 1498. Kempis, Thomas à, 1498, 3251. Kendal, Mrs., 1499. Kendall, Amos, 1499. Kendall, Henry Clarence, 1499. Kenesaw Mountain, Battle of, 1499, 384, 2614. Kenia, Mount, 31. Kenilworth, England, 1499, 1565. Kennan, George, 1499, Kennebec River, 1499, 1679, Kenneth, MacAlpin, 2563, Kenora, Ont., 2040, 2377, Kenosha, Wis., 1499, 3169, Kensington Gardene, 1400 Kensington Gardens, 1499. Kent, James, 1500, 1239. Kent, James, 1500, 1239. Kenton, Ohio, 1500. Kenton, Simon, 1500. Kentucky, 1500, 2978. Kentucky Resolutions, 1502. Kentucky River, 1502, 1500. Kentucky University, 1502, 1579. Keokuk, Iowa, 1502, 1403. Keokuk, Chief, 305. Kephallenia. 529. Kephallenia, 522. Kepler, Johann, 1503, 173, 357, 669. Kepler's Laws, 1503. Keratol (artificial leather), 1556. Kératry, Émile de, 1503. Kerguelen Islands, 899, 2251. Kernel, 2007, 2579. Kerosene, 1503, 2081, 2177. Kerr, Orpheus C., 1937, 2327. Kerry County, Ireland, 1507. Kershaw, Joseph Breyard, 1503. Kephallenia, 522. Kerry County, Ireland, 1507. Kershaw, Joseph Brevard, 1503. Kestrel, or Windhoves, 1503; falcon, 971. Ketchup, or Catsup, 1504. Ketteler, Clemens A. von, 568, 1132, 2141. Kew, England, 1504. Kewanee, Ill., 1504. Key, Francis Scott, 1504, 86, 221, 1058. Keyes, Erasmus Darwin, 1504. Key Largo, 1018.

Keynote, or Keytone, 1880. Keystone, 130; Keystone State, 2149. Key West, Fla., 1504, 1018. Khadija, 1818. Khan, 1504, 222; Yakub Khan, 29. Kharkov, Russia, 1504. Kharkov River, 1504. Khartum, or Khartoum, Sudan, 1505, 1166, 2767. Khedive, 1505, 883, 1417. Kherson River, 306. Khingan Mountains, 93. Khiva, 1505, 2944. Khorsabad, Turkey, 1505. Khorassan, 1887. Khufu (Cheops), 547.
Khyber Pass, 1505, 3149.
Kiao-chau, or Kiao-chow, 1505, 565, 1127.
Kibo, Mount, 1507.
Kickapoo Indians, 1505.
Kidd, William, 1505, 1959, 2221.
Kidnap, 1506.
Kidney, 1506, 374, 1172, 3002.
Kieft, Willem, 1506, 1959.
Kiel, Germany, 1506, 1125.
Kielland, Alexander Lange, 1506.
Kieselguhr. See Dynamite, 849.
Kieserite, 1507.
Kiev, or Kieff, 1507, 2740.
Kiev, University of, 1507, 2997.
Kilauea, 1507, 1266.
Kilbourne City, Wis., 744. Khufu (Cheops), 547. Kilbourne City, Wis., 744. Kildeer. See Plover, 2238. Kilimanjaro Mountain, 1507, 29, 1123. Killarney, Ireland, 1507, 864. Killisnoo, 23. Kill Van Kull, 1959. Kilmarnock, Scotland, 413. Kiln, 1507, 370. Kilogram, 1507, 1770. Kilogrammeter, 1507. Kilometer, 1770. Kilpatrick, Hugh Judson, 1507. Kimawenzi, Mount, 1507. Kimberley, South Africa, 1507, 470, 2681. Kin-ching, 2141. Kindergarten, 1507, 872, 1073. Kinetics, 849; kinetic energy, 915. Kindergarten, 1507, 872, 1073.
Kinetics, 849; kinetic energy, 915.
Kinetics, 849; kinetic energy, 915.
Kinetoscope, or Vitascope, 1508, 1883, 2761.
King, 1508, 1824, 2351.
King, Charles, 1509.
King, Clarence, 1508.
King, Rufus, 1509, 1831.
King, Samuel W., 819.
King, Thomas Starr, 88.
King, William Rufus, 1509, 2976.
Kingbird, 1509, 1023.
King Bird of Paradise, 297.
King Crab, or Horseshoe Crab, 1509.
Kingfishers, 1509, 1235.
King George's War, 1067.
King James Bible, 288, 1435.
Kinglake, Alexander William, 1510, 920
Kinglet, 1510; thrush, 2872.
King Philip's War, 902, 2184.
King, Books of, 1510, 289.
King's College, 1286.
King's College, 1286.
King's Evil, 2568.
Kingsley, Charles, 1510, 920, 3255.
Kingsley, Charles, 1510, 920, 3255.
Kingsley, Henry, 1510.

King's Mountain, 1510. Kingston, Jamaica, 1511, 1434. Kingston, N. Y., 1511, 1958. Kingston, Ontario, 1511, 2040. King William's Sound, 2248. King William's War, 1067. Kinkajou, or Potto, 1511. Kinkel, Gottfried, 2004. Kinsie, John H., 555. Kiolen Mountains, 1997, 2785. Kioto. See Куото, 1524. Kioto. See Kyoto, 1524.
Kiowa, 1511; Comanches, 637.
Kipling, Rudyard, 1511, 361, 920.
Kircher, Athanasius, 26, 1674.
Kirghiz, 1512, 2939.
Kirghiz Steppes, 2466.
Kirke, Sir David, 2348.
Kirksville, Mo., 1512, 2062.
Kirkwall, Orkneys, 2055.
Kirkwall Museum, 2055.
Kirkwood, Samuel Jordan, 1512.
Kirschner, Lola, 1512.
Kirschner, Lola, 1512.
Kirschwasser, 548.
Kishinev, or Kishneff, Russia, 1512.
Kiss, August, 1512, 80, 2570.
Kitan Dynasty, 2142; Kit Carson, 492.
Kitchener, Ontario. See Berlin.
Kitchener, Horatio Herbert, 1513, 792, 816.
Kite (bird), 1513; falcon, 971.
Kite, 1513, 892, 1056.
Kittredge, Alfred Beard, 1513,
Kiuchi, Leland, 1438, 1484, 1888. Kiowa, 1511; Comanches, 637. Kittredge, Alfred Beard, 1513. Kiushiu, Island, 1438, 1484, 1888. Kizil Irmak River, 306, 2941. Klamath River, 1513, 438. Klamaths, 1513. Klaproth, Martin Heinrich, 3000. Klausenburg, or Kolozsvár, Hungary, 1513, 194. Kléber, Jean Baptiste, 1895, 1966. Kleist, Heinrich von, 1514. Kleptomania, 1514, 1829. Klondike River, 1514, 3213. Klopstock, Friedrich Gottlieb, 1514, 1129, 1550. Kneipp, Sebastian, 1514. Knickerbocker, Diedrich, 1415, 2327. Knickerbocker, Diedrich, 1415, 2327.
Knife. See CUTLERY, 732.
Knight, William Angus, 1514, 786.
Knighthood, Orders of, 1514, 570, 2904.
Knights and Ladies of Honor, 274.
Knights of Labor, 1515, 1526.
Knights of Malta, 1686.
Knights of Pythias, 1515, 274.
Knights of Round Table, 156, 1176.
Knights of Saint John, 570.
Knights of Saint John and Malta, 274.
Knights of the Bath, 247.
Knights of the Garter, 1515, 3161.
Knights of the Golden Circle, 1515. Knights of the Gatter, 1313, 3161.
Knights of the Golden Circle, 1515.
Knights of the Golden Eagle, 274.
Knights of the Maccabees, 274, 1656.
Knights Templar, 570, 716, 2840.
Knitting, 1515.
Knot, 1515; Gordian Knot, 1165. Knowles, James Sheridan, 1515. Know-Nothings, 1515, 998, 2259. Knox, Henry, 1516, 2992 Knox, John, 1516, 1109, 2304, 2563, 3238. Knox, John Jay, 1516. Knox, Philander Chase, 1516. Knox, William, 3237. Knox College, 1086, 1367

Knoxville, Tenn., 1517, 2844. Knut, or Cnut, 467, 921. Koala, or Kangaroo Bear, 1517; marsupialia, 1717. Kobe, Japan, 1517, 1441. Koch, Robert, 1517, 208, 662, 1133, 2930. Kodak, 447, 2202; Kodiak Island, 51. Kodok, Sudan, 979. Koenig, Friedrich, 2314. Kohinoor, or Kohinur, 1517, 794, 1888. Kohler, Joseph, 1517. Kokomo, Ind., 1518. Kola, or Cola, 1518; kola nut, 1518. Kong Mountains, 1518, 31. Kongo. See Congo, 651. Königsrätz, Bohemia, 1518, 1823, 2483. Königsberg, Germany, 1518, 1125. Königsberg, University of, 1518. Königshütte, Germany, 1518. Koodoo, or Kudu, 1518. Koordistan, or Kurdistan, 1518. Koords, or Kurds, 147, 1518, 2164. Kootenais, or Flatbows, 1519. Kootenay, or Kootenai River, 1519. Kootenay District, 377, 453. Kop, Spion, South Africa, 348. Kopeck (coin), 2459. Koran, or Al Koran, 1519, 29, 1819. Koran Gannah, 2101. Kordofan, 1519, 1677, 2767. Korea. Sec Corea, 674. Koreish, 1818. Koreish, 1818.
Korn, Arthur, 2203.
Körner, Karl Theodor, 1519, 826.
Korolenko, Valdimir Galaktionovitch, 1520.
Kosciusko, Mount, 1520, 188, 1951.
Kosciusko, Thaddeus, 1520, 2247.
Kossova, Battle of, 2593.
Kossuth, Louis, 1520, 196, 1339.
Koster, Augustus, 2420. Koster, Augustus, 2420. Kotzebue, August von, 1521, 826. Kotzebue, August von, 1521, 820. Koumiss, or Kumys, 1521. Kovno, Russia, 1521. Kra, Isthmus of, 1683. Kraft, Adam, 1521. Krag-Jörgensen Gun, 1219, 2420. Kratatoa, Island, 1521. Krasnovodsk, Russia, 498. Krefeld, or Crefeld, Germany, 1521, 2325. Krementchug, Russia, 1521, Krementchug, Russia, 1521. Kremlin, 1522, 1857; citadel, 587. Kriemheld, or Griemhild, 1129, 1968. Krishna, 1522, 357, 1432, 3057. Krone, or Krona, 1826, 2787. Kronstadt, Austria-Hungary, 1522. Kronstadt, Austria-Hungary, 1522. Kronstadt, or Cronstadt, Russia, 1522, 2470. Kronus, or Cronus, 2883, 3000. Kropotkin, Peter Alexeyevitch, 1522. Kruger, Stephen John Paul, 1522, 2680. Krupp, Alfred, 1522, 937, 1219. Krupp Gun, 464, 1523. Krypton, 1523, 547. Kuban River, 1523. Kubelik, Jan, 1523. Kublai-Khan, 1523, 1827, 2263. Kuen-Lun Mountains, 164, 2874. Kuen-Lun Mountains, 164, 2874. Ku-Klux Klan, 1523, 2385. Kúmamóto, Japan, 1523. Kumassi, or Coomassie, Africa, 1523, 161. Kummel, 1600. Kurdistan. See Koordistan, 1518. Kurds, or Koords, 147, 1518. Kuroki, Itei, 1524, 1442, 2473.

Kuropatkin, Alexei Nikolayevitch, 1524, 2478. Kuro Sivo, or Japan Current, 1524, 728, 2076. Kuskokwim River, 1524, 49. Kutusoff, Mikhail Lavrionovich, 342. Kwangsu, Emperor, 569. Kyanite, 1524. Kyle, James H., 1513. Kyoto, or Kioto, Japan, 1524, 1441. Kyrie Eleison, 1524, 1601.

L

L, 1525, 2951. Laaland, or Lolland, Island, 1525, 781. Labiatae, 1525. Lablache, Luigi, 1525. Label, 2907; food, 1028. Labor, 1525, 2255; communism, 642; eight-hour day, 885; guild, 1214; feudalism, 992; serfdom, 2590; slavery, 2650; socialism, 2667; strike, 2761; wages, 3068.

Labor, American Federation of, 1526, 2907.

Labor Day, 1526, 1311. Labor, Division of, 806. Labor Unions, 1526; American Federation of Labor, 82; Knights of Labor, 1515; Coöperation, 667. Labouchère, Henry, 1526. Laboulaye, Edouard René Lefebvre de, 1526. Labrador, 1526, 451, 1937. Labrador, 1526, 481, 1937.

Labradorite, 1526, 985.

La Bruyère, Jean de, 3238, 3248.

Labuan, Island, 1527, 1189.

Laburnum, 1527.

Labyrinth, 1527, 1803.

Labyrinth (ear), 854.

Lac, 1527; lac dye, 1527.

Lac or Lak, 1527, 2463. Lac, or Lak, 1527, 2463. Laccadives, 1527. Lace, 1527, 389, 1161. Lacedaemon. See Sparta, 2700. Lachesis, 980. Lachine, Quebec, 1528. Lachlan River, 1528, 1952. Lachrymal Gland, 1528, 962. Lachrymal Lake, 962. Lackawanna River, 1528, 2566. La Colle, Quebec, 1528.

La Colle, Quebec, 1528.

Laconia, 2700.

Laconia, N. H., 1528.

Lacquer, 1528, 1443.

La Crosse, Wis., 1529, 3169.

Lacrosse, 1529.

Lactes 1529.

Lactes 1529.

Lactes 1529.

Lactes 1529. Lacteals, 1529, 9, 799, 1649. Lactic Acid, 1529; lactates, 1529. Lactometer, or Galactometer, 1529. Ladd, George Trumbull, 1529. Ladislaus, 1339, 1343, 1736. Ladoga, Lake, 1529, 2467. Ladrones, or Mariana Islands, 1529, 1210. Ladybird, 1530, 263. Lady of the Lake, The, 2566. Ladysmith, Battle of, 1530, 2680, 2912. Ladysmith, South Africa, 1530. Lady's Slipper, 1530. Laertius, 927. La Farge, John, 1530. Lafayette, Ind., 1530, 1380. Lafayette, Marie Jean, 1530, 2980. Lafayette College, 1531. La Follette, Robert Marion, 1531.

La Fontaine, Jean de, 1531. Lagoon, 1531, 672. Lagos, Africa, 1531, 1189. Lagos, Mexico, 1531. Lagrange, Joseph Louis, 1532. La Grippe, 927, 1387. La Guayra, Venezuela, 1532, 478. Laguna de Madre, 2851. Lahore, India, 1532, 2336. Lainore, India, 1532, 2530.

Laing, Alexander Gordon, 1532.

Lajeunesse, Marie L. C. E., 51.

Lake, 1532, 1191, 1533, 3163.

Lake Charles, La., 1532, 1636.

Lake City, Fla., 1532.

Lake District, 1533, 622, 3163.

Lake Dwellings, 1533.

Lake Erie. Battle of, 932, 2162. Lake Dwellings, 1533.

Lake Erie, Battle of, 932, 2162.

Lake Malar, or Maelar, 1533, 2786.

Lake of the Thousand Islands, 1533, 2494.

Lake of the Woods, 1533, 1799, 3163.

Lake Saint John, 2486.

Lakes (pigments), 2212.

Lakes, The Great, 1533; Erie, 933; Huron, 1343; Michigan, 1780; Ontario, 2040; Superior, 2780.

Lalla Rookh, 1844 Lalla Rookh, 1844 Lamaism, 1533; Tibet, 2874. Lamar, Lucius Quintus Cincinnatus, 1534. Lamarck, Jean Baptiste, Chevalier de, 1534. Lamartine, Alphonse Marie de, 1534, 937. Lamb, Charles, 1534, 622, 3255. Lamb, Mary Anne, 1534. Lamb, Martha Joanna, 1535. Lamballe, Marie Thérèse, Princesse de, 1535. Lambayeque, Peru, 1535. Lambert, Daniel, 1535. Lambert, Johann Heinrich, 1535. Lambertville, N. J., 1535. Lamennais, Hugues Félicité, 1048. Lamentations, Book of, 1535, 289. Lamettrie, Julien Offray, 1048. Lammergeier, 1535, 3066.
Lamont, Daniel Scott, 1535.
Lamp, 1536, 893, 1010, 2483.
Lampblack, 1536, 1389, 2081. Lampman, Archibald, 1536. Lamprey, 1536, 1230. Lanai, Island, 1265. Lancaster, England, 1536. Lancaster, Ohio, 1536. Lancaster, Pa., 1537, 2151. Lancaster, House of, 1537, 922, 1286, 2451. Lancaster Sound, 1537, 210. Lance, 1537, 258; Cossacks, 685. Lancelet, 1537. Lan-Chow, or Lanchau, China, 1537. Land, 2255, 3109; government lands, 2782; division of, 2782, 2978; Homestead Act, 1316; preëmption, 2302; single tax, 2641; real estate tax, 2826. Land Crab, 1537, 695. Landerer, Albert, 2931. Landgrave, or Landgraf, 1537. Land League, 1537, 2113. Landlord, 2841. Landon, Melville De Lancey, 1538. Landor, Walter Savage, 1538. Landscape, 1538, 2081. Landscape Gardening, 1538. Landseer, Sir Edwin Henry, 1538. Land's End, 1538, 2559. Landslide, or Landslip, 1538, 198, 1716. Landsturm, 1539, 194.

Landwehr, 1539, 194, 1193. Lane, Franklin Knight, 1539. Lane, Joseph, 1539; Henry S., 1855. Lane Theological Seminary, 260. Lanfranc, Archbishop, 1539. Lang, Andrew, 1539, 920. Lang, Benjamin Johnson, 1539. Lang, Margaret Ruthven, 1539. Langdon, John, 2989. Langensalza, Battle of, 1699.
Langland, Robert, 919.
Langland, William, 1539.
Langley, Samuel Pierpont, 1539, 1024, 2661.
Langton, Stephen, 1540.
Langtry, Lillie, 1540.
Languages, 1540; Basque, 243; Celtic, 518; Creole, 702; cuneiform, 725; Dutch, 847; Gaelic, 518, 1407; Gothic, 1170; hieroglyphic, 1299; Pennsylvania Dutch, 2152; Platt-Deutsch, 2236; Provençal, 2323; Quipu, 2357; Romance, 2436; study of, 2194; Tagala, 2191; Turanian, 2936.
Lanier, Sidney, 1540.
Lankester, Edwin Ray, 1541.
Lannes, Jean, 1541. Langensalza, Battle of, 1699. Lankester, Edwin Ray, 1541.

Lannes, Jean, 1541; Lansing, Robert, 1541.

Lansing, Mich., 1541; Lansing, Robert, 1541.

Lansingburg, N. Y., 1541.

Lantern, 1536, 2583.

Lantern, Magic, 1674, 1508.

Lantern Fly, 1541; firefly, 1003.

Lanthanum, 547.

Lancoon, 1541, 2025, 3023 Lanthanum, 547.
Laocoön, 1541, 2925, 3023.
Laodicea, 1542, 2204.
Laos, or Laotians, 1542, 1047.
La Paz, Bolivia, 1542, 328.
La Paz, Lower California, 1542.
Lapidary, 1542; diamond, 793. Lapis Lazuli, or Armenian Stone, 1542. Laplace, Pierre Simon, 1542, 173, 1915. Lapland, 1543, 1000. La Plata, Argentina, 1543, 138. La Plata, Rio de. See Plata, Rio de la, 2233. Laporte, Ind., 1543. Lapps, or Laplanders, 1000, 1543, 2936. Lapping, 1543; plover, 2239. Laramie, Fort, 1543, 3193. Laramie, Wyo., 1543, 3192. Laramie Mountains, 1544, 2434. Laramie Peak, 1544, 3191. Laramie Plains, 1543. Laramie River, 1543, 3192. Larceny, 1544, 2215; grand larceny, 1544. Larch, 1544, 2217. Larcon, Lucy. 1544, 89, 3234. Lard, 1544, 1745, 2025, 2702. Laredo, Tex., 1544, 2853. Lares and Penates, 1544. Lariet, 1546. Lark, 1544, 1743, 2884. Larkspur, 1545. Larned, J. N., 2998. Larred, J. N., 2996. La Rochefoucauld, François, 1545, 1048. Larva, 1545, 263, 419, 2636. Larynx, 1545, 3059. Lasale, III., 1545. La Salle, René Robert, 1545, 1306, 1636, 1818. Las Casas, Bartolomé de, 1546. Las Palmas, Canary Islands, 1546. Lassalle, Ferdinand, 1546. Lassen, Christian, 725. Lasso, 1546, 84; lariat, 1546. Last of the Mohigans, The, 666.

Las Vegas, N. M., 1546, 1948. Lateran, 1546. Lathe, 1547. Lathrop, George Parsons, 1547. Lathrop, George Parsons, 1547.
Latimer, Hugh, 1547, 697, 2072.
Latin Empire. See Rome, 2442.
Latin Language. See Rome, 2442.
Latins, or Latini, 1547, 2442.
Latinus, King, 2442, 3054.
Latitude, 1547, 772, 1626.
Latour D'Auvergne, Théophile Malo de, 1547.
Latter-Day Saints, 1547, 1850. Laube, Heinrich, 826. Laud, William, 1548, 2337. Laudanum, 1548, 2042. Lauderdale, John Maitland, Duke of, 424. Laughing Gas, 1548.
Laughing Jackass. See Kingfishers, 1509.
Laughlin, James Laurence, 1548.
Laughter, 1548, 1354.
Laura, Petrarch's, 2176. Laureate, Poet, 1548. Laurel, 1548, 1021; cherry laurel, 548. Laurens, Henry, 1549. Laurens, Jean Paul, 1549. Laurens, John, 1549. Laurentian Mountains, 1549, 2348. Laurentian Period, 1115. Laurier, Wilfrid, 1549, 456, 2936. Laurium, Mich., 1549. Lausanne, Switzerland, 1549, 2795. Lausanne, Switzerland, 1549, 2795.
Lauterbrunnen, Switzerland, 1478.
Lava, 1550, 3060.
Laval, France, 1550.
Laval-Montmorency, François Xavier de, 1550.
Laval University, 1550, 2348, 2350.
Lavater, Johan Kaspar, 1550. Lavender, 1551, 2025. Laveran, Charles Louis, 1551, 1683. Lavisse, Ernest, 1048. Lavoisier, Antoine Laurent, 1551, 546, 2073. Law, 1551, 465, 642, 661, 1397. Law, John, 1551, 1810. Lawn Mower, 1552. Lawn Tennis, 1552; tennis, 2844. Lawrence, Kans., 1552, 1490. Lawrence, Mass., 1552, 1729. Lawrence, Abbott, 1552. Lawrence, Abbott, 1552.
Lawrence, Sir Henry Montgomery, 1553.
Lawrence, James, 1553, 549, 3238.
Lawrence, John Laird Mair, 1553.
Lawrence, Saint, 1553.
Lawrence, Sir Thomas, 1553. Lawrenceburg, Ind., 1553.
Law of the Twelve Tables, 2445.
Laws, national, 653, 2306; international, 1397; banking, 226; divorce, 806; interest, 1396; insurance, 1396; marriage, 1714; naturalization, 1905; poor, 2271; tariff, 2819; Draco's, 823; Justinian's, 1481; Pericles', 2159; Roman, 2442; Solon's, 2673. Solon's, 2673. Law Schools, 873. Lawrence University, 121, 1553. Lawton, Henry Ware, 1553, 1329, 2982. Lay of the Last Minstrel, The, 2566. Layard, Sir Austen Henry, 1553, 1978. Lazarus, 1554, 286, 1673, 2101. Lazzaroni, 1554. Lea, Henry Charles, 1554.Lead, 1554, 547, 1085; black, 1182; red, 1554; white, 1554, 3141.

Lead, S. D., 1554, 306, 2691. Lead Pencils, 1182, 2145. Lead Poisoning, 1554. Leadville, Col., 1555, 632. Leaf, 1555, 347, 2233. Leaf Insects, 1555, 1793. League, 1555; mile, 1786. League of American Wheelman, 734. Leah, 1431, 1577. Leander. See Hero, 1294. Leaning Towers, Bologna, 329; Pisa, 2222. Leap Year, 1555, 436, 1839, 3203. Lear, King, 2603. Learned Blacksmith, The, 414. Leather, 1556, 1299; morocco, 1556; shagreen, 2601; tanning, 1556. Leather, Artificial, 1556. Leatherback, 1556; tortoise, 2899. Leather Stocking Series, The, 666. Leavenworth, Kans., 1557, 1490. Lebanon, Pa., 1557. Lebanon Mountains, 1557, 515, 2801. Lebrun, Charles, 1557, 1569. Lebrun, Charles F., 802, 1895. Lebrun, Marie Anne Élizabeth, 1557. Lech River, 1557, 1222. Lecky, William Edward Hartpole, 1557, 920. Leclaire, Edné-Jean, 1558. Leclerc, Victor Emmanuel, 2905. Lecompton Constitution, 1558.
Le Conte, Joseph, 1558.
Le Conte, Lewis, 1558.
Leconte de Lisle, Charles Marie, 1558, 1048. Leconte de Lisle, Charles Marie, 1558, 1048. Ledyard, John, 1558. Lee, Ann, 1558, 2602. Lee, Arthur, 1559. Lee, Charles, 1559, 1829. Lee, Fitzhugh, 1559, 1743. Lee, Francis Lightfoot, 1559, 2995. Lee, Harriet, 826. Lee, Henry, 1560, 989. Lee, Richard Henry, 1560, 2995. Lee, Robert Edward, 1560, 122, 531, 1060, 1134, 1180, 1466, 2981, 3056, 3097, 3247. Lee, William, 1515. Leech, 1561; medical leech, 1561. Leech, 1561; medical leech, 1561. Leech, John, 1561. Leech Lake, 1561. Leeds, England, 1561, 918. Leek, 1561. Leeuwenhoek, Anthony, 208. Leeward Islands, 1562; Antilles, 113; Guadeloupe, 1209; Martinique, 1719; Virgin Islands, 3057; Windward Islands, 3161. Lefebvre, François Joseph, 1562. Lefebvre, Jules Joseph, 1562. Leg, 1562, 2646. Legacy, 1502, 2040. Legacy, 1562; will, 3149. Le Gallienne, Richard, 1562. Legal Tender, 1562, 1826, 2841. Legend, 1563, 1176, 2594, 2814, 3141. Legendre, Adrien Marie, 1563. Legerdemain, 1563, 1476. Leghory, 1542, 1563. Leghorn, Italy, 1563. Legion, 1563, 150, 2918. Legion of Honor, 1563, 349. Legislative Body, 652, 998, 2984. Legislature, 1564, 169. Legislature, 1564, 169. Legnano, Battle of, 1058. Legnano, Battle of, 1058. Leguminosae, 1384, 2129. Lehigh River, 1564, 677. Lehigh University. See Bethlehem, 286.

Leibnitz, Gottfried Wilhelm, 1564, 434, 2196. Leibnitz Mountains, 1843. Leicester, England, 1565, 918. Leicester, Robert Dudley, 1565, 1499. Leichhardt, Ludwig, 191. Leidy, Joseph, 1565. Leif Ericsson, 1565, 1359, 1995. Leigh, Aurora, 385. Leighton, Frederick, Baron, 1565. Leighton, Robert, 1565, 3252. Leipsic, or Leipzig, Germany, 1566, 1128. Leipsic, Battles of. See Leipsic, 1566. Leipsic University, 1566, 2997. Leipsic University, 1306, 2397.
Leiter, Mary Victoria, 730.
Leith, Scotland, 1566.
Leitner, Gottlieb Wilhelm, 1566.
Leitner, Thomas L., 2813.
Leland, Charles Godfrey, 1566, 2327.
Leland Stanford Junior University, 1566, 439. 2997 Lely, Sir Peter, 1567. Leman, Lake, 1567, 1109. Le Mans, France, 1567, 1060. Lemars, Iowa, 1567. Lemberg, Austria, 1567, 194, 1086. Lemming, 1567; banded lemming, 1568. Lemnian Earth, 1568. Lemnos, Island, 1568, 25. Lemnos, Island, 1508, 25. Le Moine, Sir James MacPherson, 1568. Lemon, 1568, 587, 2025. Lemon, Mark, 1568, 2335. Lempa River, 2510. Lemur, 1569, 1628; monkey, 1828. Lemuria, 1918. Lena River, 1569, 749, 2425. Lend a Hand Club, 1235. Lenormant, Charles, 1569. Lenormant, François, 1569. Lenôtre, André, 1569. Lenox, James, 1569, 1961. Lens, 1569, 1782, 2042, 2702, 2838. Lent, 1569, 859, 979. Lentil, 1570. Leo. See Zodiac, 3223. Leo I., of Rome, 1570, 182, 2273. Leo II., 1570. Leo III., 1570, 2273, 2388. Leo III., 1570, 2273, 2388
Leo IV., 1570, León, Nicaragua, 1571, 1970. León, Spain, 1571. Leonardo da Pisa, or Leonardo Bonaccio, 1571, Leonhard, Karl Cäsar von, 1571. Leonidas, 1572, 2861, 3195. Leontes River, 2083, 2801. Leopard, 1572, 487. Leopardi, Giacomo, 1572. Leopald of Hohenzollern, 1897, 2309. Leopold I., of Germany, 1572.

Leopold II., of Germany, 1572, 1051. Leopold I., of Belgium, 1572, 267. Leopold II., of Belgium, 1572, 267, 652. Leopold, Prince, 52.
Leopoldville, Congo Free State, 1573, 652.
Lepanto, Battle of, 1462, 1573, 2186, 2943.
Lepanto, or Naupaktos, Greece, 1573.
Lepanto, Gulf of, 1573, 676. Lepers, 1573, 1822.
Lepidopterous Insects, 419, 1859.
Lepidus, M. Aemilius, 1573, 115, 2922.
Leprosy, 1573, 899.
Lepsius, Karl Richard, 1573.
Lerdo de Tejada, Sebastian, 795, 935.
Lermontoff, Mikhail Yuryevitch, 1574, 2470.
Le Sage, Alain René, 1574, 1048.
Lesbos, or Mytilene, Island, 1574, 25.
Les Chots Falls, 2066.
Lesina, Island, 1574.
Leslie, Charles Robert, 1574,
Lesseps, Ferdinand de, 1574, 2094, 2768.
Lesser Antilles, 113, 1562, 3161.
Lessing, Gotthold Ephraim, 1575, 826, 1129, 3 Lepers, 1573, 1822. Lesser Antilles, 113, 1562, 3161.
Lessing, Gotthold Ephraim, 1575, 826, 1129, 3256.
Lethe, 1575; Elysium, 908.
Leto, 118, 794, 1979.
Letter, 1575, 2299; dead, 764.
Letters of Marque and Reprisal, 1575, 653.
Letts, 1575, 1607.
Lettuce, 1575, 3025.
Leucadia Island or Santa Maura Island, 1576. Leucadia Island, or Santa Maura Island, 1576. Leucippus, 780. Leuctra, Greece, 1576, 36, 1195. Leuthen, Battle of, 1576. Leuthen, Germany, 1576. Leutze, Emanuel, 1576. Levant, 1576, 997, 1598. Levasseur, Emile, 1576. Levee, 1576, 1634, 1807. Level, 1576; plumb line, 1576. Lever, 1577, 1746, 1877. Lever, Charles James, 1577.
Leverrier, Urbain Jean Joseph, 1577, 1922.
Levi, 1577, 1455, 1578.
Lévis, or Point Levi, Quebec, 1577.
Levites, 1577, 2568.
Leviticus, 1578, 289, 2154.
Lewes, George Henry, 1578.
Lewis, Charles B., 1578, 2327.
Lewis, Cornwall, 920.
Lewis, Francis, 2995.
Lewis, Meriwether, 1578, 3095.
Lewis and Clark, 1362, 1447, 1578, 2691, 3095.
Lewis and Clark Exposition, 1578, 2281.
Lewis River, 3093.
Lewiston, Idaho, 1579. Lever, Charles James, 1577. Lewiston, Idaho, 1579. Lewiston, Me., 1579, 1681. Lewiston, N. Y., 1579. Lexington, Battle of, 1579, 1729, 2979. Lexington, Ky., 1579, 1502. Lexington, Mass., 1579, 1729, 2403. Lexington, Mo., 1579. Lexington, Va., 1580. Leyden, or Leiden, Holland, 1580, 1927. Leyden, Lucas Van, 1580. Leyden, Siege of, 3151. Leyden, University of, 1580, 1926. Leyden, University of, 1580, 1926. Leyden Jar, 1580, 892. Leys, Jean Auguste Henri, 1580. Leyte, Island, 2187. Lhassa, or Lassa, Tibet, 1580, 2875. Liana, or Liane, 1580. Lias, 1581, 1115, 2040.

Libau, Russia, 1581. Libby Prison, 1581; Libby Hill, 2415. Libel, 1581, 2215; damages, 745. Liber (Roman god), 205. Liberal Republican, 1581, 1197. Liberals, 1581, 658, 1147. Liberal Unionist, 1581. Liberia, 1581, 33. Liberty, Statue of, 1582, 1960. Liberty Bell, 1582, 769. Liberty Party, 1582, 1063. Libra. See Zodiac, 3223. Library, 1582, 172, 335, 486, 2996. Library of Congress, 1584, 3092. Library of Congress, 1364, 3092. Libyan Desert, 90, 881. License, 1584, 1714. Lichen, 1584, 1358, 1607, 1646. Lichtenberg, Germany, 1585, 281. Licinius, of Rome, 659. Lick, James, 1585. Lick Observatory, 1585, 439, 2015. Lictor, 1585; praetor, 2300. Liddon, Henry Parry, 1585, 920. Lie, Jonas Lauritz Edemil, 1585. Liebig, Justus, 1585, 546, 1027. Liechtenstein, 1586, 950. Liége, Belgium, 1586, 266, 1531. Liegnitz, Battle of, 1586. Liegnitz, Duke of, 2635. Liegnitz, Germany, 1586. Lieutenant, 2394; (general), 2394. Lifeboat, 1586; boat, 320. Life Buoy. See Buoys, 406. Life Insurance. See Insurance, 1395. Life-Saving Apparatus, 1587, 406. Life-Saving Service, 1587, 2991. Ligament, 1587, 1028, 2646. Ligament, 1987, 1028, 2040.

Light, 1587; arc, 134; Drummond, 834; electric, 893; lime, 1593; mirage, 1805; moonlight, 1842; phosphorescence, 2200; polarization of, 2252; prism, 2315; radiometer, 2363; shadow, 2600; spectroscope, 2703; twilight, 2948; velocity of, 1490; radioal, 2923. 1480; zodiacal, 3223. Lighthall, William Douw, 1589. Light Horse Harry, 1560. Lighthouse, 1589, 63, 869, 1671. Lightning, 1590; thunder, 1590. Lightning Bugs, 1003, 1152. Lightning Rod, 1590, 1056. Lignite, or Brown Coal, 1590, 609. Ligny, Battle of, 317, 1208, 1896, 3102. Liguria, 1591.
Li Hung Chang, 1591, 569.
Lilac, 1591, 582, 1021.
Lilienthal, Otto, 1591, 1024.
Liliuokalani, Lydia Kamakeha, 1591, 1267.
Lille, or Lisle, France, 1592, 1047.
Lily, 1592, 1021, 1630, 2933; calla, 3070; Victoria, 3045; water, 3102.
Lily of the Valley, 1592.
Lima, Ohio, 1592, 2024.
Lima, Peru, 1592, 2169.
Lima Bean, 252, 1067.
Limberger Cheese, 545.
Lime (plant), 1593, 2025; linden, 1597.
Lime, 1593; carbonate, 1593, 1704; coral, 672; lime felspar, 985; slacked lime, or hydrate, 1593; sulphate, 2773.
Lime Light, 1593, 834.
Limerick, Ireland, 1593, 1406.
Limestone, 1593, 518, 813, 2914. Liguria, 1591.

Limoges, France, 1593. Limonite, 1593, 1409. Limpet, 1593, 570, 1821. Lincoln, England, 1594, 1596. Lincoln, Ill., 1594. Lincoln, Neb., 1594, 2978. Lincoln, Abraham, 1594, 908, 1596, 2976. Lincoln, Benjamin, 1595, 773, 2607. Lincoln, Robert Todd, 1596. Lincoln Cathedral, 1596, 1594. Lincoln's Gettysburg Address, 1596, 1135. Lind, Jenny Maria, 1596, 234, 501, 2380. Lindau, Paul, 1596. Linde, Carl, 1600, 2920. Linden, 1597. Linden, 1597. Lindsay, Ontario, 1597. Lindsay, William, 1597, 486. Lineal Measure, 1744; chain, 526. Linen, 1597, 1012; carpet, 490. Ling, 1597; blenny, 1598. Ling, Pehr Henrik, 1598. Lingard, John, 1598. Liniment (arnica), 152. Liniment (arnica), 152. Linnaea, 1598. Linnaea, 1598.
Linnaeus, Carl von, 1598, 347, 2787, 3225.
Linnet, 1598; finch, 999.
Linoleum, 1598, 2075.
Linotype, 1598, 1761, 2952.
Linseed Oil, 1599, 1012, 2025, 2081.
Lintel, 1599; arch, 130.
Linton, W. J., 697.
Linz, Austria, 1599.
Lion, 1599; of Lucerne, 1642; sea lion, 2574.
Lion, American, 688, 2334 Lion, American, 688, 2334. Lion, American, 688, 2334. Lipari, or Aeolian, Islands, 1599. Lippe River, 3128. Lippi, or Fra Filippo, 1600. Lippincott, Mrs. S. J., 2327. Lipsius, Justus, 1927. Lipton, Sir Thomas Johnstone, 1600, 3198. Liqueur, 1600. Liquid, 1600, 545, 1100, 1735. Liquid Air, 1600, 1100, 2920. Liquidambar, 1601, 3171. Liquor, Fermented, 261, 988, 2333, 3162. Liquorice. See Licorice, 1585. Liquor Traffic, 1613, 2319, 2902. Lire (money), 1826. Lire (money), 1829. Lisbon, Portugal, 1601, 858. Lisle, Rouget de, 1715. Lister, Sir Joseph, 1601. Li-Sung, of China, 1523. Liszt, Franz, 1601, 1130, 1879. Litany, 1601, 1524. Litchfield, Ill., 1601. Litchfield, Ill., 1601.
Liter. See Metric System, 1770.
Literature, 1602; American, 84; Arabian, 125;
Assyrian, 171; Augustan Age, 185, 2444; Babylonian, 204; ballads, 216; Bible, 287; Chinese, 567; drama, 825; Dutch, 1927; Egyptian, 883; Elizabethan Age, 919; English, 918; fables, 965; Finnish, 1000; folklore, 1026; French, 1048; German, 1129; Greek, 1194; Icelandic, 1358; Iranian, 1405; Italian, 1421; Jewish, 1457; Koran, 1519; letters, 1575; Lettic, 1575; minnesingers, 1799; mythology, 1885; Persian, 2164; Phoenician, 2198; poetry, 2245; Polish, 2248; Portuguese, 2287; proverbs, 2323; Roman, 2445; Russian, 2470; Sanskrit, 2523; Scandinavian, 783, 1999, 2545, 2787; Spanish, 2696; Swedish, 2787; Syriac, 2801; troubadours, 2924; Turanian, 2936; Turkish, 2943. Litharge, 1606, 1021; pottery, 2295. Lithia, 70; lithium, 1606. Lithium, 1606, 547, 1777. Lithography, 1607, 2202. Lithotomy, 1607. Lithuania, 1607, 1575, 2651. Litmus, 1607; litmus blue, 70. Little Bear, 253. Little Big Horn River, Battle of 5 Little Big Horn River, Battle of, 731. Little Crow, 1607. Little Falls, Minn., 1608. Little Falls, N. Y., 1608. Littlejohn, Abram Newkirk, 1608. Littlejohn, Abram Newkirk, 1608 Little Miami River, 1776. Little Pedee River, 1191. Little Rhody State, 2407. Little Rock, Ark., 1608, 145. Little Saint Bernard, 1248, 2488. Little Shoshone Falls, 2620. Little Turtle, 1608, 1776. Littre, Maximilien E., 797. Liturgy, 1608, 242, 1524. Live Oak, 2011. Liver, 1609, 292, 1441. Livermore, Mary Ashton Rice, 16 Livermore, Mary Ashton Rice, 1609. Liverpool, England, 1609, 918. Liverwort, 1610, 392. Livingston, Mont., 1610, 1835. Livingston, Edward, 1610. Livingston, Edward, 1610. Livingston, Philip, 1610, 2995. Livingston, Robert R., 1610, 1637. Livingston, William, 1610, 2989. Livingstone, David, 1610, 651, 2725. Livonia, 219, 2471. Livre, 1611. Livy, Titus Livius, 1611, 2445. Lizard, 1611, 92, 529, 1364. Llama, 1612, 1210, 3046. Llamo Estacado or Staked Plain, 139, 2851. Llanos, 1612; pampas, 2090. Llewellyn, Prince, 876, 3072. Llewellyn Park, 2045. Lloyd, Henry Demarest, 1612. Lloyd's, 1612, 1. Lloyd's, 1612, 1.
Loadstone, or Magnetic Iron Ore, 1612, 1675,
Loam, 1612. See Soil, 2671, 596.
Loanda, Saint Paul de, Angolia, 1612.
Lobanoff-Rostofsky, Prince, 1612.
Lobeira, Vasco de, 79.
Lobelia, 1613, 2246; cardinal flower, 481.
Loblolly Pine. See Pine, 2217.
Lobster, 1613, 698, 2622.
Lobworm, or Lugworm, 1613.
Localization, 592. Localization, 522. Local Option, 1613, 2902. Loch Leven, 1613. Loch Linnat, Scotland, 435. Loch Linnat, Scotland, 455.
Loch Lomond, 1613, 275, 2562.
Lock (canal), 1613, 459, 2093.
Lock, 1613, 2483.
Locke, David Ross, 1614, 2327.
Locke, John, 1614, 874, 919, 940.
Lockhart, John Gibson, 1614.
Lock Haven, 22, 1614. Lock Haven, Pa., 1614.
Lock Haven, Pa., 1614.
Lockjaw, 2850, 2640.
Lockout, 2761.
Lockport, N. Y., 1614.
Lockwood Belva Ann Bennett, 1614.
Lockyer, Joseph Norman, 1615. Locofoco, 1615. Locomotive. See Steam Engine, 2733. Locust, 1615; acacia, 11.

Locust, 1615, 580, 1182, 1699. Locy, William Albert, 1615. Lodes, or Veins, 1795, 2049, 3026. Lodge, Henry Cabot, 1616. Lodge, Oliver Joseph, 1616. Lodi, Italy, 1616, 20. Lodz, Russia, 1616, 2470. Loeb, Jacques, 1616. Loes, Jacques, 1016.
Loess, 1616; Quartenary Period, 2347.
Lofoden, or Lofoten, Islands, 1617, 1997.
Log, 1617; log book, 1617.
Logan, Utah, 1617, 3006.
Logan, John, 1617; Cayuga Indians, 514.
Logan, John Alexander, 1617, 770.
Logan, Mrs. John A., 239.
Logan, Mount, 1618, 1987.
Logansport, Ind. 1618, 1380 Logansport, Ind., 1618, 1380. Logansport, 1nd., 161: Logan Stones, 2432. Logarithm, 1618, 2653. Log Book, 1618. Logic, 1618, 1, 1734. Logwood, 1619, 849. Lohengrin, 1037, 3069. Loire River, 1619, 1045. Loki, 1620, 214. Lolkes, Wybrand, 847. Lollards, 1620, 159, 3191 Lonards, 1620, 139, 3191. Loma Tina, Mount, 1272. Lombard, Peter, 1620. Lombards, 1620, 535, 1422. Lombardy, 1620, 1743, 2128. Lombardy Poplar, 2274. Lombok, 15land, 1620, 2774. Lombroso, Cesare, 1620. Lomond, Loch, 1613, 2562. Lomond, Loch, 1613, 2562.
London Company, 3056.
London, England, 1621; Buckingham Palace, 1622; Charter House School, 860, 1622; Chelsea, 545; Christ's Hospital, 576; Covent Garden, 691; Crystal Palace, 2129; Exeter Hall, 959; fire, 536; Hyde Park, 1347, 1621; Kensington Gardens, 1499; Newgate, 1939; obelisk, 1622, 2013; plague, 536, 2229; police, 2254; Saint James' Park, 1621; Saint Paul's, 1622; Smithfield, 2660; Thames, 2854; Tower, 2905; Vauxhall, 3024; Westminster Abbey, 3127. London, Ontario, 1623, 2040. London, Jack, 1623. London, University of, 1624, 1622 London, University of, 1624, 1622.
Londonderry or Derry, Ireland, 1624.
Lone Star State, 2850.
Long, John Davis, 1624.
Long, Stephen S., 632.
Long Branch, N. J., 1624.
Longevity, 1624, 1396.
Longfellow, Henry Wadsworth, 1625, 59, 87, 1297, 3235, 3239, 3243.
Long Island, 1625, 1956.
Long Island, 1625, 1956.
Long Island City, 1964.
Long Island Flats, Battle of, 2609.
Long Island Sound, 1626, 1959.
Longitude, 1626, 772, 855, 1547.
Longley, James Wilberforce, 1626.
Longobards, 329, 2378.
Long Parliament, 1626, 536, 710, 2462.
Long's Peak, 2434. Long's Peak, 2434. Longstreet, James, 1626, 950, 970, 1060. Longworth, Nicholas, 1626. Loo-Choo, Liu Kiu, or Riu Kiu, Islands, 1626. Lookout Mountain, 542. Lookup Legion, 1235.

Loom, 1627, 495, 1432, 3112. Looming, 1805. Looming, 1805. Loomis, Charles Battell, 1627. Loomis, Elias, 1627. Loon, Great Northern, 805. Lope de Vega. See Vega Carpio, 3025. Lopes, Fernam, 2287. Lopez, Narciso, 1627, 721. Loquat, 1627. Lorain, Ohio, 1627. Lorca, Spain, 1628. Lords, House of, 1564, 2111. Lorelei, 1628. Lorenz, Adolf, 1628. Loreto, or Loretto, Italy, 1628. Loreto, Sisters of, 1628. Lorimer, George Horace, 1628. Loris, 1628; lemur, 1569. Lorne, Sir John Douglas, 1628. Lorraine, 1628, 1132. Los Angeles, Cal., 1629, 2975. Lossing, Benson John, 1629, 88. Lot, 1629, 2670. Lothaire II., of Lorraine, 1628. Loti. See Viaud, Louis Marie Julien, 3041. Lotophagi, 2957. Lottery, 1629, 255, 1040, 1258. Lotus, 1630, 1021, 1920, 2957. Lotze, Rydolf Hermann, 1630. Loubet, Émile, 1630, 1050. Louis, 1631. Louis Ludwig I., of France, 1631, 535. Louis II., of France, 1631. Louis IV., of France, 1631. Louis IV., of France, 1631, 1049. Louis VI., of France, 1631. Louis VI., of France, 1631. Louis VII., of France, 1631. Louis VIII., of France, 1631. Louis IX., of France, 1631. Louis IX., of France, 1631, 350.

Louis XI., of France, 1631, 408, 539, 2107.

Louis XII., of France, 1631, 1051, 3014.

Louis XIII., of France, 1631, 1049, 2932.

Louis XIV., of France, 1632, 350, 1049, 1334, 2107, 2937, 3037.

Louis XV., of France, 1632, 244, 1049, 1708, 2267.

Louis XVI., of France, 1632, 1049, 1050, 1708, 2038 2938. Louis XVII., of France, 1633, 1708. Louis XVIII., of France, 1633, 537, 1050, 1896. Louis II., of Hungary, 1339, 1817. Louis I., of Portugal, 1633, 2288. Louis I., of Bavaria, 416. Louis II., of Bavaria, 1633. Louis the German, 1047. Louisa, 1633, 1061 Louisland, 1634, 468. Louisiade, Islands, 1634, 2264. Louisiana, 1634, 1021, 2978. Louisiana, Mo., 1636. Louisiana Lottery, 255, 1258, 1630. Louisiana Purchase, 1637, 1447, 1831, 2982. Louisiana Purchase Exposition, 1637, 960. Louisiana Purchase Exposition, 1637, 960.
Louisiana State University, 1637.
Louis Napoleon. See Napoleon III., 1896.
Louis Philippe, 1637, 1050, 1279.
Louisville, Ky., 1638, 2974.
Lourenço Marques, Africa, 2289, 2681.
Louse, 1638, 2104, 2544.
Louvain, Belgium, 1638, 2997.
L'Ouverture, 1272, 2904.

Louvre, 1639, 2106. Lovejoy, Elijah Parish, 1639, 2193. Lovelace, Richard, 1639. Lovelace, Richard, 1639. Lover, Samuel, 1639. Loverlies-bleeding, 79. Lover's Leap, The, 1576. Low, Seth, 1639, 486. Low, Will Hicock, 1639. Low Archipelago, 1640. Lowell, Mass., 1640, 1729. Lowell, James Russell, 1640, 88, 2245, 3236, 3242, 3255 3255. Lower California, 440, 1772. Lower Empire, 422. Lower Empire, 422. Low German, 1128, 2236. Lowlands, Scotland, 2561. Lowndes, William, 1640. Loyalty Islands, 1641. Loyola, Ignatius of, 1641, 3194. Loyson, Charles, 1641. Lubbock, Sir John, 1641, 992. Lübeck, Germany, 1641, 1250. Lublin, Russian Poland, 1641. Lucan, 56. Lucan, 56. Lucania, steamboat, 2733. Lucania, steamboat, 2733. Lucania, 1642, 1642. Lucerne, 1642, 64. Lucerne, Lake of, 1642, 2793. Lucerne, Switzerland, 1642, 268. Lucia, Saint, Island, 1642. Lucian, 1642, 1649. Lucier, 1642, 3030. Lucilius, Gaius, 1642. Lucknow, India, 1642, 1377, 2068. Lucretia, 1643. Lucretius, Titus Lucretius Carus, 1643, 927. Lucullus, Lucius Lucinius, 1643, 1815. Lucy's Dome, 1688. Ludington, Mich., 1643. Ludlow, William, 1643. Ludwig, Alfred, 1643, 826. Ludwig I., or Louis de Debonnaire, 1644, 525. Ludwig I., or Louis de Debonnaire, 1644, 525. Ludwig, I., Karl August, 1644. Ludwigshafen, Germany, 1644. Luini, or Luvino, Bernardino, 1644. Luke, Saint, 1644, 289, 1169. Lukin, Lionel, 1586. Lullin, Marie, 1331. Lumbago, 1644, 2409. Lumber, 1644: architecture, 132; forest, 1031. Lumpfish, or Lumpsucker, 1645. Lump Iaw, or Lumps Iaw, 1645. Lump Jaw, or Lumpy Jaw, 1645. Luna, 1645; S-lene, 2581. Lunacy, 1645; insanity, 1392. Lunar Eclipse, 866, 1842. Lunar Theory, 1645. Lundy, Benjamin, 1645. Lundy's Lane, 1645, 2566, 2980, 3085. Lungs, 1645, 380, 662, 2238, 2401. Lungwort, 1646, 001 Lupercalia, 1646, 991. Luray, Va., 1646. Luray Cave, 1646. Lusiads, 448. Lusiads, 448.

Lute, 1646; guitar, 1217.

Luther, Battle of, 573, 2879.

Luther, Martin, 1647, 536, 885, 931, 3172; Augsburg Confession, 183; Bible, 287, 1129; Lutherans, 1647; Reformation, 2388, 2850.

Lutherans, 1647, 183, 2322.

Lützen, Germany, 1648, 1222, 1896, 2075. Lützen, Germany, 1648, 1222, 1896, 3075.

Luxembourg, Palace of, 1648, 2106.
Luxemburg, 1648, 950.
Luzón, Island, 1648, 2187.
Lyceum, 1648, 140.
Lycia, 1648, 166.
Lycurgus, 1648, 176, 2700.
Lyddite, 1649.
Lydekker, Richard, 1649.
Lydia, 1649, 166, 709, 2204, 2530.
Lyell, Sir Charles, 1649, 1114, 1146.
Lyell, Mount, 438.
Lyle, or Lyly, John, 919.
Lymph, 1649, 662.
Lymphatic System, 1649, 9, 1529, 2868.
Lynch, Arthur, 2256.
Lynch, James, 1650.
Lynch James, 1650.
Lynchburg, Va., 1650, 3056.
Lynchburg, Va., 1650, 3056.
Lynch Law, 1650.
Lyndhurst, John Singleton Copley, 1650.
Lynn, Mass., 1650, 1729.
Lynx, 1650, 2591, 3147.
Lyon, Mary, 1651, 1239.
Lyon, Nathaniel, 1651, 2552.
Lyons, Edmund, Lord, 1651.
Lyons, France, 1651, 1047.
Lyons, Gulf of, 1651, 2410.
Lyons, University of, 1651, 2997.
Lyre, 1651, 1652.
Lyre Bird, 1651.
Lyric Poetry, 1652, 412, 1194, 2245.
Lysias, 1652, 1194.
Lysimachia, 1652; moneywort, 1652.
Lysias, 1652.
Lytton, Edward George Earle, 1653, 826, 920.
Lytton, Edward, Earl of, 1653, 2327.

M

M, 1654, 141, 2951.

Maartens, Maarten, 1654.

Mab, 1654; Queen Mab, 1654.

Mabie, Hamilton Wright, 1654.

Macadam, John Loudon, 1654.

Macadamization, 1654; pavement, 2127.

McAdoo, William Gibbs, 1654.

McAll Mission, 1654. Macalester College, 2498

McAlpin, Kenneth, 2563.

Macao, China, 1654.

Macaroni, 1654, 1027.

MacArthur, Arthur, 1655, 2982.

McArthur, Duncan, 1655.

McAuley, Catherine Elizabeth, 1760.

Macaulay, Thomas Babington, 1655, 1075, 2389

Macaw, 1655, 2114.

Macbeth, 1656, 1660, 2563.

McBurney, Charles, 1656.

Maccabees, 1656, 2520.

Maccabees, Books of, 118, 289

Maccabees, Knights of the, 1656, 274.

McClerlan, Geo. B., 1274, 1872.

McClellan, George Brinton, 1656, 557, 1595, 1686

McClerland, John Alexander, 1657, 2614, 2615.

Macclesfield, England, 1657.

McClintock, Sir Francis Leopold, 1657.

McCloskey, John, 1657.

McClure, Alexander Kelly, 1657. McClure, Sir Robert, 2077, 2248. McClurg, Alexander Cadwell, 1658. McCook, Alexander McDowell, 1658, 557, 2162. McCook, Daniel, 1658.
McCook, Robert Latimer, 1658.
McCormick, Cyrus Hall, 1658, 1261.
McCormick Theological Seminary, 1658.
McCosh, James, 1658, 3237.
McCurdy, Lames Frederick, 1658. McCosh, James, 1658, 3237.
McCurdy, James Frederick, 1658.
McCutcheon, John Tinney, 1659, 482.
Macdonald, Etienne Jacques, 1659, 317.
Macdonald, Flora, 1659.
Macdonald, George, 1659, 920, 2563.
Macdonald, Sir John, 1659, 456, 3097.
McDonough, Thomas, 1660, 3085.
McDowell, Irvin, 1660, 255, 403.
Macduff, 1660; Macbeth, 1656.
McDuffie. George, 1660. Macduff, 1600; MacDeth, 1656.

McDuffie, George, 1660.

Mace, 1660, 2008, 2707.

Macedonia, 1660, 2184, 2862, 2939.

Macedonian Wars, 781, 2443.

Maceió, or Maçayó, Brazil, 1660.

McEnery, Samuel Douglas, 1661.

Maceo, Antonio, 1661, 722, 1163.

Macfarren, Sir George Alexander, 1661.

McGee, Thomas D'Arcy, 1661. Macfarren, Sir George Alexander, 1661. McGee, Thomas D' Arcy, 1661. McGillivray, Alexander, 1661. McGilli University, 1661, 1841. Macgregor, John, 1662, 464, 2327. Macgregor, Robert, 2430. Macgregor, Sir William, 1662. McHenry, James, 2989. Machiavelli, Niccoló di, 1662, 1422, 2729. Machine, Flying, 26, 1023. Machine Gun, 1662, 158. Machlin's Bible, 335. Maciejowice, Battle of, 1520. Mackay, Charles, 920.
Mackay, John William, 1663.
McKean, Thomas, 2995.
McKeesport, Pa., 1663, 2151.
McKees Rocks, Pa., 1663.
McKenna, Joseph, 1663.
McKenna, Joseph, 1663. Mackensen, August von, 1663, 1567. Mackenzie, 1663, 458, 1497. Mackenzie, 1663, 458, 1497.
Mackenzie, Alexander, 1664, 456.
Mackenzie, Sir Alexander, 1664.
Mackenzie, Sir Alexander Campbell, 1664.
Mackenzie, Sir Morell, 1664.
Mackenzie, William Lyon, 1664, 2040, 2383.
Mackenzie River, 1663, 1987, 2425.
Mackerel, 1664, 2796.
McKim, Charles Follen, 1665.
Mackinac, or Mackinaw, 1665, 1781 McKim, Charles Follen, 1665.
Mackinac, or Mackinaw, 1665, 1781.
McKinley, Mount, 1665, 2490.
McKinley, William, 1665, 738, 2976, 3238, 3243.
McKinley Tariff Bill, 2820.
Mackintosh, Sir James, 475.
Maclaren, Ian. See Watson, John, 3105.
McLaren, William Edward, 1666.
McLaren, William Edward, 1666.
McLaurin, Anslem Joseph, 1666.
McLennan, William, 456.
Macleod, Alberta, 55.
Maclise, Daniel, 1666.
Maclure, William, 1666.
Macmahon, Marie Edme, 1666, 1050, 2578. Macmahon, Marie Edme, 1666, 1050, 2578. McMaster, John Bach, 1667, 88, 1605. McMillin, Benton, 1667. McMonnies, Frederick, 1667. Macomb, Ill., 1667; Macomb, Alexander, 1667.

Macon, Ga., 1667, 1121. Macon, Mo., 1667; Nathaniel, 1667. Macpherson, James, 1668, 2061. McPherson, James Birdseye, 1668. Macready, William Charles, 1668, 1034. McReynolds, James Clark, 1668. Maculae, or Sun Spots, 2776. Macveagh, Wayne, 1668, 486. Madagascar, Island, 1668, 879, 1381. Mad Anthony Wayne, 3109. Madder, 1669, 70. Mad Dog. See Нургорновіа, 1350. Madeira, Islands, 1670, 3162. Medeira River, 1669, 80. Madeleine, Church of, 2106. Madero, Francisco I., 1776, 3280. Madison, Ind., 1670; Madison, Wis., 1670, 2978. Madison, James, 1670, 85, 2976, 2989, 3239. Madonna, 1671, 581, 1720. Madra, Laguna de, 2851. Madras, India, 1671, 1377. Madrid, Spain, 1671, 2696. Madrid, University of, 2696, 2997. Madura, India, 1672. Madura, Island, 1672. Maderas, 3053 Maecenas, 3053. Maelstrom, or Malström, 1672, 1617, 3137. Maelzel, Johann, 1770. Maerlant, Jakob van, 1013. Maestricht, or Maastricht, Holland, 1672, 1711. Maeterlinck, Maurice, 1672. Mafeking, South Africa, 1672, 2680. Mafia, 1672. Magadyne, 851.
Magdala, Abyssinia, 1893.
Magdalena River, 1672, 626.
Magdalene, Mary, 1672.
Magdalen Islands, 1673, 2494.
Magdeburg, Germany, 1673, 2389, 2879. Magee College, 1624. Magee College, 1624.
Magellan, Ferdinand, 1673, 855, 2120, 2191, 2877.
Magellan, Strait of, 1673, 2120.
Magenta, Italy, 1673, 1667.
Maggiore, Lake, 1673, 2793.
Maggots, 316, 545, 1545, 2293.
Magi, 1673, 1453.
Magic, 1674; witchcraft, 3171.
Magic Lantern, or Stereopticon, 1674, 1508.
Magna Charta, 1674, 769, 1339, 1460, 1480, 1540.
Magnesia, 1674. Magnesia, 1674. Magnesium, 1674, 547, 1507. Magnet. See Magnetism, 1674.
Magnetic Pole, 929, 2252, 2452.
Magnetism, 1674; electrobiology, 1764.
Magnetite, 1675, 1409.
Magneto-Electric Machine, 850, 890, 894. Magnificat, 1676. Magnitudes, 661, 2728. Magnolia, 1676, 1021. Magnus Henriksen, 2788. Magog, 112, 1159. Magoon, Charles E., 722. Magpie, 1676, 714, 1445, 2361. Magruder, John Bankhead, 1676, 1687, 3154. Magruder, John Bankhead, 1676, 1687, 3154. Magyars, 194, 1000, 1339. Mahabárata, 1676, 2372, 3057. Mahaffy, John Pentland, 1676. Mahan, Alfred Thayer, 1677. Mahan, Dennis Hart, 1677. Mahanadi, or Mahanuddy River 1677. Mahanadi, or Mahanuddy, River, 1677. Mahanoy City, Pa., 1677.

Mahdi, 1677, 1166, 1505. Mahdi Rebellion, 1677. Mahmoud II., 1677, 1437. Mahmud of Ghazni, 1377. Mahmud of Ghazni, 1377. Mahogany, 1677, 3027. Mahomet. See Монаммер, 1817. Mahrattas, 1678. Mahwa Tree, 243. Mai, Cardinal Angelo, 2085. Maia, 2237. Maid of Orleans, 1459, 537. Maid of Saragossa, 2528. Maiden, Joseph Henry, 1678. Maidenhair, 1678. Maidenhair, 1678. Mail, 2290; stamps, 2290, 2722. Mailable Matter, 2291. Mailable Matter, 2291.
Maimonides, 1678, 1054.
Main River, 1678, 1054.
Maine, 1678, 1021, 2978.
Maine, Battleship, 722, 1265, 2982, 3280.
Maine, Sir Henry James Sumner, 1681, 576.
Maine, University of, 1681, 1680.
Maintenon, Françoise, 1681, 1632, 2546.
Mainz, See Menry, 1758. Maintenon, Françoise, 1681, 1632, 254
Mainz. See Mentz, 1758.
Mair, Charles, 1681.
Maitland, William, 1681.
Maize. See Corn, Indian, 678.
Majesty, 1682, 21.
Majolica, 1682, 967, 2296.
Major, 1682, 2394; general, 2394.
Majorca, Island, 1682, 215.
Majority, 1682, 2112, 2358.
Majuba Hill, Battle of, 1472, 2912.
Makaw, 1682. Makaw, 1682. Malabars, 525. Malacca, or Malakka, 1682, 2755. Malacca, Strait of, 1682, 2774. Malachi, 289, 2320. Malachite, 670. Maladetta, Mount, 2340. Malay Peninsula, 1683, 2774.

Malay 1824, 2696.

Malar. See Lake Malar, 1533.

Malaria, 1683, 41, 448, 944, 2860.

Malay Archipelago, 1683, 1823, 2187.

Malay Peninsula, 1683, 2774. Malays, 1684, 941. Malays, 1684, 941.
Malbone, Edward Greene, 1684.
Malcolm, Sir John, 1684.
Malcolm I., of Scotland, 1684, 2563.
Malcolm II., of Scotland, 1684, 592, 2563.
Malcolm III., of Scotland, 1684, 2563, 3151.
Malcolm IV., of Scotland, 1684, 2564.
Malden, Mass., 1684.
Maldive Islands, 1684.
Male Organs (botany), 1020. Male Organs (botany), 1020. Malheur, Lake and River, 1684, 2049. Malibran, Marie Felicita, 1684. Malins, Joseph, 2901. Mallard Duck, 837. Malleability, 1684, 107, 837. Mallery, Garrick, 1685. Mallery, Garrick, 1685.
Malleus, or Hammer, 854.
Mallock, William Hurrell, 1685.
Mallory, Stephen Russell, 1685.
Mallow, 1685; marsh mallow, 1717.
Malmö, Sweden, 1685, 2787.
Malone, Sylvester, 1685.
Malory, or Mallore, Sir Thomas, 1685.
Malpighi, Marcello, 1686, 568, 1394.
Malplaquet, France, 1686, 945, 1711, 3049.
Malt, 1686, 261, 3138.
Malta, Island, 1686, 1750.

Malta, Knights of, 1686. Maltese Cat, 503. Maltese Cross, 1686, 3046; cross, 713. Maltese Goat, 1156. Maltese Cross, 1686, 3046; cross, 713.

Maltese Goat, 1156.

Malthus, Thomas Robert, 1686, 2276.

Malus, Etienne Louis, 1589.

Malvern Hill, Battle of, 1686, 2148.

Mamaroneck, N. Y., 1687.

Mamelukes, or Mamalukes, 1687, 884, 2802.

Mammalia, 1687, 3225.

Mammalia, 1687, 3225.

Mammalis, 1687, 2343, 3225.

Mammary Glands, 1148, 1687, 1787.

Mammoth, 1687, 1951; mastodon, 1733.

Mammoth Cave, 1688, 513.

Mammoth Trees, 2589.

Man, 1688, 940, 1156, 2309.

Man, Calf of, 1689.

Man, Isle of, 1689, 1409.

Man Afraid of His Horse, 1889.

Managua, Lake of, 1689, 1970.

Managua, Nicaragua, 1689, 1970.

Managua, Nicaragua, 1689, 1970.

Manasseh, 1689, 835, 1455, 1471.

Manasses, Prayer of, 118, 289.

Manatee, or Sea Cow, 1689, 1687, 2643.

Menby, George William, 1690.

Manchester, Conn., 1690.

Manchester, N. H., 1690, 1942.

Manchester, Va., 1690, 3056.

Manchester Ship Canal, 1691.

Manchus, 1691, 2473, 2626, 2822.

Mandalay, India, 1691, 1377.

Mandamus (in law), 1704, 3187. Mandalay, India, 1691, 1377. Mandamus (in law), 1704, 3187. Mandan, N. D., 1691, 1578. Mandarin, 1691.
Mandarin, 1691.
Mandeville, Sir John, 2488.
Mandingo, 1692; Mandi, 1692.
Mandolin, 1692.
Mandrill, 1692, 1741.
Mandrill, 1692, 203. Mandrites, 2. Mandries, 2.
Manetho, 1692, 884.
Manfred, of Sicily, 1692.
Manganese, 1692, 547, 1766.
Mange, 1693; scab, 2544.
Mangel-Wurzel, or Field Beet, 1693, 262.
Mangola, 1823.
Mangola, 1823.
Mangosteen, 1693 Mangosteen, 1693.
Mangrove, 1693.
Manhattan Beach, 648.
Manhattan Island, 1693, 1960. Manhattan Island, 1693, 1960.
Manila, or Manilla, Philippines, 1694, 1648, 2191.
Manila Hemp, 1694, 1261, 1284.
Manioc, 2817, 3126.
Manistee, Mich., 1694, 1780.
Manitoba, 1694, 455, 3163.
Manitoba, Lake, 1697, 1695.
Manitoulin Islands, 1697, 1343, 2038.
Manitoulin Islands, 1697, 1343, 2038.
Manitowoc, Wis., 1697, 3169.
Mankato, Minn., 1697, 1801.
Mann, Horace, 1697, 875, 1730, 3239, 3250.
Manna, 1698; eucalyptus, 943.
Mannheim, or Manheim, Germany, 1698.
Manning, Henry Edward, 1698. Manning, Henry Edward, 1698. Manoa, City of, 888. Man-of-War, 1698; steamboat, 2732.

Mans, Le. See Le Mans, 1567. Mansfield, Mount, 3032. Mansfield, Ohio, 1698, 2024. Mansfield, Richard, 1699. Manson, Patrick, 1699. Mantagna, Andrea, 1699. Mantegna, Andrea, 1699. Manteuffel, Edwin Hans Karl, 1699. Mantis, 1699; locust, 1615. Mantua, Italy, 1699. Manual Training, 1700, 872, 2555. Manuel, of Byzantine, 717.

Manure, 1700, 2397; fertilizers, 991; garbage, 1095; guano, 1211. Manuscript, 1701, 2100, 2104.
Manutius, Aldus, 2335.
Man Without a Country. The, 1701, 1235.
Manx Language, 1689. Manx Language, 1689.
Manytch, or Manych, River, 1701.
Manzanillo, Cuba, 1701.
Manzanil, Alessandro, 1701, 825, 1422.
Maoris, 1701, 1966.
Map, 1702, 1759; chart, 540.
Maple, 1702, 2770, 2797.
Maple Sugar, 1703, 2770.
Marabou, 1703, 22.
Maracaybo, or Maracaibo, 1703, 2683, 3027.
Marajó, or Joannes Island, 1703.
Maranhão, or São Luiz, Brazil, 1703.
Maraschino, 548. Maraschino, 548. Marat, Jean Paul, 1703, 2429. Marat, Jean Paul, 1703, 2429.
Marathon, Greece, 1703, 248, 1791.
Maratli, Carlo, 1704.
Marble (toy), 1704.
Marble, 1704, 490, 901, 1593, 2040.
Marble, Manton, 1704.
Marble Faun, The, 1269.
Marblehead, Mass., 1704.
Marbury Decision, 1704.
Marcellus, Marcus Claudius, 1704, 2018.
March, 1705, 1839. March, 1705, 1839. March, Francis Andrew, 1705. March, Francis Andrew, 1705.
Marchand, Jean Baptiste, 1705, 979.
Marconi, Guglielmo, 1705, 892, 2836.
Marco Polo. See Polo, 2262.
Marcus Aurelius. See Aurelius, 186.
Marcy, Mount, 22.
Marcy, William Learned, 1705.
Mardi Gras, 1705, 486, 2622.
Mardonius, 3195.
Mare Island, 1706, 2518 Mare Island, 1706, 2518. Marengo, Italy, 1706, 61, 1895. Margaret, of Denmark, 1706, 783. Margaret, of Valois, 1288. Margaret, Saint, 1706. Margaret Beaufort, 2932. Margaret of Anjou, 1706, 1286, 2451, 3208. Margaret of Navarre, 1706, 1048. Margarita, Island, 1706. Maria I., of Portugal, 2288. Maria Christina, of Spain, 1706, 1415. Maria Louisa, queen of Napoleon I., 1707, 1895. Mariana, Juan de, 2696.
Maria Theresa, of Germany, 1707, 196, 1051.
Maria Theresiopel, 1707, 1340.
Mariazell, Austria, 1707. Marie Antoinette, Josèphe Jeanne, 1707, 1632. Marietta, Ohio, 1708. Marignano, Italy, 1752, 1838. Marigold, 1708, 577, 1021. Marinette, Wis., 1709, 3169. Mario, Giuseppe, 1709, 1206.

Marion, Ind., 1709. Marion, Ohio, 1709. Marion, Francis, 1709; Marion's Brigade, 1709. Mariotte, Edme, 1100. Mariotte, Edme, 1100.
Mariposa Grove, 2589, 3209.
Maritime Provinces, 457.
Maritza River, 400, 2940.
Marius, Caius, 1709, 429, 584.
Marjoram, 1710, 2025.
Majorca, 215, 1802.
Marjorie Fleming, 384.
Marjory, daughter of Pobert Marjore Fieming, 384.

Marjory, daughter of Robert I., 2762.

Mark (money), 1710, 1826, 2854.

Mark, Saint, 1710, 288, 289.

Mark Antony. See Antonius, Marcus, 115.

Markham, Clements Robert, 1710, 135.

Markham, Edwin, 1710.

Mark Twain, 598, 2327.

Marl 1711, 596. Marl, 1711, 596. Marlboro, Mass., 1711. Marlborough, John Churchill, 1711, 312, 3049. Marlowe, Christopher, 1711, 826, 919. Marlowe, Julia, 1712. Marmalade, 2355. Marmont, Auguste Frédéric Louis Viesse de, Marmora, Sea of, 1712, 753, 2940. Marmoset, 1712; monkey, 1828. Marmot, 1712, 2301. Marne River, 1712, 527. Marnix, Philip van, 1713, 1927. Maronites, 1713, 1557. Maroons, 1713. Maros River, 1713, 2857. Marot, Clement, 1713, 1048. Marque. See Letters of Marque and Repri-SAL, 1575. Marquesas, Islands, 1713. Marquette, Mich., 1713, 1870. Marquette, Jacques, 1713, 1367, 1468, 1808. Marriage, 1714, 806, 1204, 1343, 2264; Hymen, Marriages (Gretna Green), 1204. Marriages (Gretna Green), 1204.
Marryat, Frederick, 1714.
Mars (god), 1714, 1839.
Mars (planet), 1715, 2231, 2534, 2849.
Mars Hill, or Areopagus, 136, 176.
Marseillaise, 1715, 1903.
Marseilles, France, 1715, 1047.
Marsh, 1715, 448, 2134.
Marsh, George Perkins, 1716.
Marsh, Othniel Charles, 1716.
Marshal, 1716; police, 2253.
Marshal Forward, 317. Marshall, Mo., 1716; Marshall, Tex., 1716, 2853. Marshall, Mo., 1716; Marshall, Tex., 1716, 2853.
Marshall, John, 1716, 756, 1239.
Marshall, Thomas Riley, 1716, 2976, 3280.
Marshalltown, Lowa, 1717, 1403.
Marshfield, Wis., 1717.
Marsh Mallow, 1717, 1685.
Marston, Westland, 1717, 919.
Marston Moor, England, 1717, 536, 2463.
Marsupialia, 1717, 190, 557, 1488, 1517, 1687, 2043.
Martaban, Gulf of, 1737, 2511.
Martel, Charles, 488, 1844, 2155, 2247.
Marten, 1717; pine marten, 1717. Marten, 1717; pine marten, 1717. Martha, 285, 1673. Martha's Vineyard, Island, 1717, 1727. Martial, Marcus Valerius Martialis, 1717. Martial Law, 1718. Martin, 1509; swallow, 2783. Martin, Bon Louis Henri, 1048.

Martin, John, 1718. Martin, Saint, 1718. Martin, Theodore, 1718. Martin, William Alexander, 1718. Martin I., of Rome, 1718, 2273.
Martin II., of Rome, 1718.
Martin III., of Rome, 1718.
Martin IV., of Rome, 1718, 2273.
Martin IV., of Rome, 1718, 2273.
Martin V., of Rome, 1718, 920, 2193, 3241.
Martineau, Harriet, 1718, 920, 2193, 3241.
Martineau, James, 1719.
Martinisburg, W. Va., 1719, 3130.
Martinisburg, W. Va., 1719, 3130.
Martin's Ferry, Ohio, 1719.
Martius, Carl Friedrich Philip von, 1719.
Martyn, Henry, 1720.
Martyr, 1720, 1547, 2125, 2263, 2418, 2539, 3001, 3002. Martin I., of Rome, 1718, 2273. Martyr, Justin, 2639. Marvel, Ik, 1814, 2327. Marx, Karl, 1720, 2255, 2668. Marx, Kari, 1720, 2255, 2008.

Marxsen, Edward, 357.

Mary, 285, 1554, 1673.

Mary, Virgin, 1720, 1453, 1471, 1671.

Mary I., of England, 1720, 903, 922.

Mary II., of England, 1721, 922, 3151.

Maryland 1721, 2978. Mary Magdalene. See Magdalene, 1672. Mary of Burgundy, 1739. Mary Stuart, Queen of Scots, 1723, 348, 904, 1051, Marysville, Cal., 1724. Masaccio, 1724. Masai, 1724. Masaniello, 1724. Masaniello, 1724.
Masaya, Nicaragua, 1724, 1970.
Masbate Islands, 2187.
Mashonaland, 1724, 2409.
Mask, 1725, 1824; death mask, 1725.
Mason, George, 1725.
Mason, James Murray, 1725, 3148.
Mason, Jeremiah, 1725.
Mason, John Young, 1725.
Mason, Lowell, 1726.
Mason, and Dixon's Line, 1726, 1723. Mason and Dixon's Line, 1726, 1723. Mason and Dixon's Line, 1726, 1725.
Mason Bee, 1726; carpenter bee, 260.
Mason City, Iowa, 1726.
Masonic Temple, 134, 554.
Masonry. See Freemason, 1062.
Masque, 1726; drama, 825.
Mass, 1726, 1806; high mass, 1727.
Mass (physics), 1727; matter, 1735.
Massachusetts, 1727, 2978.
Massachusetts, Agricultural College, 172 Massachusetts Agricultural College, 1729. Massachusetts Bay, 1730. 1727. Massachusetts Bay Colony, 1730, 3166. Massachusetts Indians, 1730. Massachusetts Institute of Technology, 1730. Massage, 1730; osteopathy, 2062. Massage, 1730; osteopathy, 2062.
Massalsky, Princess, 817.
Massasoit, 1730, 2184, 3164.
Masséna, André, 1731.
Massenet, Jules Émile Frédéric, 1731.
Massey, Gerald, 1731.
Massillon, Ohio, 1731, 2024.
Massillon, Jean Baptiste, 1731, 1048.
Massinger, Philip, 919.
Masson, David, 1732.
Masson, Frederich, 1048.
Mast, 2487, 2616.
Master and Servant, 1732, 1918. Master and Servant, 1732, 1918. Master of Arts, 1732, 773.

Mastersingers, or Meistersingers, 1732. Mastication, 1732, 69, 2505, 2832. Mastiff. See Dog, 810. Mastodon, 1733, 800, 899. Mastoid Process, 854. Mat, or Matting, 490, 620. Matabeleland, 1733, 2409. Matamoros, Mexico, 1733, 387. Matamoros, Mexico, 1733, 387.

Matamoros, Mariano, 1733.

Matanzas, Cuba, 1733, 720.

Matches, 1733, 2200.

Mate, or Paraguay Tea, 1734, 1312.

Matchlock, 149, 1219.

Materialism, 1734, 1157, 2711.

Materia Medica, 1734, 1749.

Mathematicians, 131, 787, 944, 1532, 1563, 1954, 2118 Mathematics, 1734, 66, 141, 434, 787, 1116, 1399, 1532, 1542, 1563, 1758, 1954.
Mather, Cotton, 1734, 85, 3171. Mather, Increase, 1734. Mather, Increase, 1734.
Mathew, Theobald, 1735, 477, 2901.
Mathews, William Smythe Babcock, 1735.
Matilda, Queen of England, 2738.
Matsys, Quentin, 1735.
Mattathias, 1656.
Matteawan, N. Y., 1735.
Matter, 1735, 546, 1100, 1251.
Matterhorn, 1735.
Matthews, Saint, 1735, 119, 288.
Matthews, Lames Brander, 1736. Matthews, James Brander, 1736.
Matthews, James Brander, 1736.
Matthews, Stanley, 1736.
Matthews, Corvinus, 1736, 1339.
Mattoon, Ill., 1736.
Mauch Chunk, Pa., 1736; Maui, Island, 1265.
Maude, Frederich Stanley, 210.
Maulmain, or Moulmein, Burma, 1736, 411.
Maumee River, 1736, 1038 Maumee River, 1736, 1038. Mauna Kea, Mountain, 1737, 1266, 2265. Mauna Loa, 1737, 1266. Maundy Thursday, or Holy Thursday, 1737, 1315. Maupassant, Henri René Albert Guy de, 1737. Maurice, of Orange, 1737. Maurice, of Saxony, 1737, 537, 2552, 2710. Maurice, John Frederick Dennison, 1737, 920. Mauricius, Flavius Tiberius, 1737. Mauritania, 1738, 1852.
Mauritania, 1738, 1852.
Mauritius, or Isle of France, 1738, 2282.
Maurus, Hrabanus, 797.
Maury, Matthew Fontaine, 1738.
Mauser-Mannlicher Rifle, 2420.
Mausoleum, 1738, 2809.
Max, Gabriel, 1738.
Mayentius, 650 Maxentius, 659. Maxim, Hiram Stephens, 1738.

Maximilian, of Mexico, 1739, 1475, 1775, 1805.

Maximilian I., of Germany, 1739, 1131, 1631.

Maximilian II., of Germany, 1740. Maxim Noiseless Gun, 1739.
Maxims, Legal, 1740.
Max-Müller, Friedrich, 1740, 873.
Maxwell, James Clerk, 1740.
Maxwell, Mrs. John, 1740.
Maxwell, William Henry, 1740.
May, 1740, 1839; Maypole, 1740.
May, Cape, 471, 1944.
May, Phil, 1741.
May, Samuel I 7 Maxim Noiseless Gun, 1739. May, Samuel J., 7. Maya, 1741; Indians, 1382. May Apple, 1741, 1692. May Bug, 615.

Mayence. See Mentz, 1758.
Mayer, Nathan, 2454.
Mayflower, 1741, 129, 1306, 2214, 2241.
Mayhew, Henry, 2335.
Maynard, Mass., 1741. Maynooth, Ireland, 1741. Mayo Hospital, 1741.
Mayo Hospital, 1532.
Mayor, 1741, 1871, 2254.
Mayorte, or Mayotta, Island, 1741, 643.
Maysville, Ky., 1741.
Mayweed, 1742; fennel, 986.
Mazarin, Jules, 1742, 289, 1334, 1632.
Mazarin Bible, 289, 1223.
Mazarlán, Mexico, 1742.
Maze, 1527; mystic maze, 1527 Mazarth Mexico, 1742.

Mazatlán, Mexico, 1742.

Mazeppa, Ivan Stephanovitch, 1742.

Mazzppa, Ivan Stephanovitch, 1742.

Mazzini, Giuseppe, 1742, 1097, 1423.

Mead, 989, 1317, 3012.

Mead, Larkin Goldsmith, 1743.

Meade, George Gordon, 1743, 1134, 1319.

Meadow Lark, 1743, 1544, 2728.

Meadville, Pa., 1743.

Meander River, 166, 717, 1786.

Measles, 1744, 993.

Measure, 1744; acre, 16; foot, 1028; metric system, 1770; mile, 1786.

Measuring Worm, 1744; spanner, 506.

Meat Packing, 1744, 206, 1240, 2792.

Mecca, or Mekka, Arabia, 1745, 125, 1818.

Mechanical Powers, 1746; lever, 1577; pulley, 2332; screw, 2567.

Mechanics, 1746, 1030, 1071, 1173, 1427, 1576, 2332, 2567.

Mechanicsville, N. Y., 1746. Mechanicsville, N. Y., 1746. Mechanicsville, Battle of, 1746, 557. Mechlin, or Malines, Belgium, 1746. Mecklenburg Declaration, 1746, 1992. Mecklenburg-Schwerin, 1128, 2558. Medal, 1746. Medea, 1746, 1444. Medellin, Colombia, 1747, 627. Medels, 1747, 1978, 2165. Medford, Mass., 1747. Media, 1747, 737, 2571. Mediaeval History, 1305. Medical Schools, 1747, 873, 1749. Medical Schools, 1747, 873, 1748 Medici, 1748, 1016. Medici, Catherine de', 507, 1287. Medici, Cosmo de, 1748, 2947. Medici, Lorenzo de', 1748, 102. Medicine, 1748, 73, 1734, 2062. Medicine, Schools of, 873. Medicine Hat, Canada, 1749, 55. Medill Joseph 1749 Medill, Joseph, 1749, Medilla, Arabia, 1749, 1818.
Medina, Arabia, 1749, 1818.
Medina, N. Y., 1749.
Mediterranean Sea, 1749, 946. Medulla Oblongata, 358, 2709.
Medusa, 1750, 1167, 2141, 2162.
Medusae, 1750; jellyfish, 1448.
Meerschaum, 1750, 1674, 2220.
Megacles, 2222. Megacles, 2222.
Megalosaurus, 800.
Megaphone, 1750, 871.
Megatherium, 1750, 869.
Mehemet Ali, 1750, 884, 1356.
Meigs, Fort, 2024.
Meissonier, Jean Louis Ernest, 1751.
Mekong, or Cambodia, River, 1751, 563, 2623.
Melancholia, 1392.
Melanchthon, Philipp, 1751, 874, 1647, 3172.
Melanesia, 2264.

Melanesian Islands, 2077, 2264. Melas, General, 1706. Melba, Nellie, 1751. Melbourne, Australia, 1752, 192, 3045. Melbourne, William Lamb, 1752, 3046. Melchizedek, 1752. Meleager, 1752. Melegnano, Italy, 1752; Melek Shaw, 2582. Melinite, 959.
Mellen, Charles Sanger, 1752.
Melloni, Macedonio, 1275.
Melodeon, 1753, 2053.
Melodeon, 1753, 2053. Melodeon, 1753, 2053.
Melodrama, 1753, 825.
Melody, 1753; harmony, 1753.
Melon, 1753, 587, 1172, 2009.
Melos, Island, 1753, 734, 1972.
Melpomene, 1753, 1878.
Melrose, England, 2566.
Melrose, Mass., 1753.
Melting Pot, The, 3216.
Melville, George Wallace, 1753.
Melville Island, 1753.
Melville Peninsula, 1753. Melville Peninsula, 1753. Melville Peninsula, 1753. Membrane, 1754, 358, 1757, 2590, 2748. Membraneous Croup, 714. Memling, Hans, 1754, 387. Memminger, Christopher Gustavus, 1754. Memnon, 1754. Memorabilia, 3195. Memorial Day, 770, 1311, 1618. Memory, 1754, 181, 1385, 2328. Memphis, Egypt, 1755, 2339. Memphis, Tenn., 1754, 2844. Memphremagog, Lake, 1755, 3033. Menado, 1823. Menai Strait, 1755, 102. Menam River, 1755, 1385, 2623. Menander, 2846. Menangkabo, State of, 1684. Menasha, Wis., 1755. Mendelssohn-Bartholdy, Felix, 1755, 1879. Mendelssohn-Bartholdy, Felix, 1755, 187 Mendez Pinto, Fernam, 1756. Mendicant Orders, 1756, 485, 815, 1052. Mendocino, Cape, 437, 471. Mendoza, Argentina, 1756. Mendoza, Antonio de, 2313. Mendoza, Diego de, 2696. Menelaus, 1756, 33, 1280, 2925. Menelek II., 11. Menéndez de Avilés, Pedro, 1756, 2488. Menes, 1755 Menekk II., II.
Menéndez de Avilés, Pedro, 1756, 2488.
Menes, 1755.
Menhaden, 1756, 1211.
Meningitis, 1757, 1274, 2709.
Menkaura, 2340.
Menlo Park, N. J., 871.
Mennonites, 1757.
Menno Simons. See Mennonites, 1757.
Menominee, 1757.
Menominee, Mich., 1757, 1780.
Menomonie, Wis., 1757.
Menschikoff, Alexander Danilovitch, 1757, 74
Mensuration, 1758, 585, 793.
Menton, Bernard de, 2488.
Mentone, or Menton, France, 1758.
Mentor, 1758, 2837, 2957.
Mentz, or Mainz, Germany, 1758.
Menzel, Adolf von, 1758.
Menzel, Adolf von, 1758.
Menzel, Adolf von, 1758.
Menzel, Adolf von, 1759, 179, 1702.
Mercator's Projection, 1759, 179, 1702.
Mercer, Hugh, 1759, 149.
Merchant Marine, 1759; transportation. 2911.

Merchants' Bridge, 2496. Mercia, 102, 1289. Mercier, Honoré, 1759. Mercury, 1759. Mercury (astronomy), 1759, 2231. Mercury, or Quicksilver, 1760, 79, 547, 2702.
Mercury Subchloride, 442.
Mercy, Comte de, 647, 2937.
Mercy, Sisters of, 1760.
Mercy Seat, 1760. Mercy Seat, 1760.
Mer de Glace, 1760, 76, 1146.
Meredith, George, 1760, 920.
Meredith, Owen, 1653, 2327, 3249, 3256.
Merganser, 1761, 2610.
Mergenthaler, Ottmar, 1761, 2313, 2952.
Merici, Angela, Saint, 3002.
Mérida, Mexico, 1761, 3212.
Mérida, Venezuela, 1761.
Meriden, Conn. 1761, 656. Meriden, Conn., 1761, 656. Meridian, 1761, 855, 1626. Meridian, Miss., 1761, 1809. Mérimée, Prosper, 1762, 2004. Merino, 1762, 2608. Merivale, Charles, 1762. Merlin, 1762, 971. Merlin, Ambrosius, 1762. Mermaid, 1762, 969. Meroe, Kingdom of, 940. Merope, 2237. Merope, 2237.
Merovingians, 1762, 1130.
Merrill, Wis., 1762.
Merrimac, 1763, 1309.
Merrimac River, 1762, 1727.
Merritt, Wesley, 1763.
Merry del val, Rafael, 1763.
Mersey River, 1763, 299, 917.
Merthyr-Tydfil, Wales, 1763.
Merton College, 2072.
Merv, 1763, 2939.
Mesaba Iron Range, 1410, 19 Mesaba Iron Range, 1410, 1283, 1800. Mesentery, 1763, 2568. Mesentery, 1763, 2508.
Mesha, 1815.
Meshed, or Meshid, Persia, 1763.
Mesmer, Friedrich Anton, 1764.
Mesmerism, 1764, 592.
Mesopotamia, 1764, 204, 2878.
Mesozoic, 1765, 35, 1115.
Mesquite, 1765; grass, 1182.
Mescalina, 1922. Messalina, 1922 Messenia, or Messena, 1765. Messiah, 1765, 1688. Messina, Sicily, 1765, 858, 2627. Messina, Strait of, 1765, 858. Messizos, 2517.
Meta River, 1765, 2054.
Metacarpal Bones, 1246, 2647.
Metallurgy, 1765, 546.
Metals, 1766, 546, 2049.
Metamorphic Rocks, 1766, 1114.
Metamorphics, 1767, 419, 1545.
Metaphor, 1767, 997, 2638.
Metaphysics, 1767, 1793; psychology, 2327.
Metatarsal Bones, 1028, 2646.
Metaurus, or Metauro, Battle of, 248, 1262.
Metaurus, or Metauro, Battle of, 248, 1262.
Metchnikoff, Iliya, 1767.
Meteor, 1767, 26.
Meteorology, 1768, 1232, 2368, 2633, 2665.
Meter. See Metre, 1770.
Meter, electric, 694; gas, 1101; hydrometer, 1350; hygrometer, 1353; water, 3104.
Methane, or Marsh Gas, 1769. Mestizos, 2517.

Methodist, 1769, 33, 3122. Methods in Reading, 1604, 2380. Methods in Writing, 3188. Methods of Teaching, 2830; pedagogy, 2135, 2127. Methuen, Mass., 1769. Methusaleh, 924. Methyl Alcohol. See Alcohol, 57. Metius (Jacob Adriansz), 1589. Meton, 734, 1769, 2159. Metonic Cycle, 1769, 734.
Metonomy, 1770; figure of speech, 997.
Metre, or Meter, 1770.
Metric System, 1770; measure, 1744.
Metronome, 1770. Metronome, 1770.

Metropolitan Museum of Art, 1961.

Metternich, Clemens Wenzel Lother, 1770.

Metz, Germany, 1771, 251.

Meuse River, 1771, 265.

Mexican War, 1771, 533, 1775, 2566, 2980.

Mexico, 1772; Aztecs, 201, 1775; Cortez, 683;

Lower California, 440; Maximilian, 1739, 795;

national emblem, 1020; silver, 2638; Texan
War, 1775, 2853; Toltecs, 201, 1775; Yucatan, 3912. 3212. Mexico, Mo., 1772.
Mexico, Mexico, 1772, 684, 1838.
Mexico, Gulf of, 1776, 179, 1773.
Meyer, George von Lengerke, 1776.
Meyer, Hans, 135, 1507. Meyer, George von Lengerke, 1776.
Meyer, Hans, 135, 1507.
Meyerbeer, Giacomo, 1776, 1130, 1879.
Meyerheim, Paul, 1776.
Mezzotint, 923: mezzo-rilievo, 2569.
Miami Canal, 583.
Miami Indians, 1776, 1608, 2025,
Miami River, 1776, 2022.
Miami University, 2071.
Mica, 1776, 2809.
Micah, 1777, 289, 2320.
Michael, 1777, 101.
Michaelangelo. See Angelo, 101.
Michaelmas Day, 1777.
Michailovitch, Alexis, 2471.
Michel, Louise, 1777. Michel, Louise, 1777 Michelet, Jules, 1777 Michelson, Albert Abraham, 1777.
Michigan, 1778, 1021, 2978.
Michigan, Lake, 1780, 1533, 2967.
Michigan, University of, 1781, 2997.
Michigan City, Ind., 1781, 1380.
Mickiewicz, Adam, 1781, 2248.
Micrococci, 207.
Micrometer, 1781, 1058 Micrometer, 1781, 1058. Micronesian Islands, 1781, 2016, 2264. Micronesian Islands, 1781, 2016, 2264.
Microscopianism, 114.
Microphone, 1781, 871, 2707.
Microscope, 1782, 1569, 2671.
Midas, 1783.
Middle Ages, or Mediaeval Period, 1783, 754, 874, 2553. 874, 2553.
Middleboro, Mass., 1783.
Middleboro, Mass., 1783.
Middlebury, Vt., 3034.
Middlesbrough, England, 1783.
Middleton, Arthur, 2995.
Middleton, Thomas (1570-1627), 919.
Middletown, Conn., 1783, 656.
Middletown, N. Y., 1783.
Middletown, Ohio, 1783.
Middletown, Pa., 1784.
Midianites, 1784.
Midsummer Night's Dream, 2603. Midsummer Night's Dream, 2603. Mieczyslaw I., 2247.

Mifflin, Thomas, 1784, 2989. Mignonette, 1784, 2989.
Mignonette, 1784, 299, 1369.
Miguel, Dom Maria, 2288.
Mikado, 1440, 2615, 2619.
Milan, Italy, 1784, 1421.
Milan I., of Servia, 1785, 2593.
Milan Cathedral, 1785. Milan Cathedral, 1785.
Milbanke, Isabella, 421.
Milburn, William Henry, 1785.
Mildew, 1785, 1078.
Mile, 1786, 1744.
Mile End, Quebec, 1786.
Miles, Nelson Appleton, 1786, 1134, 2284.
Miletus, Asia Minor, 1786, 1639.
Milford, Mass., 1786.
Military Schools, 1786, 1579, 3128.
Military Uniforms, 2961.
Military Uniforms, 2961.
Military List army, 149. Military Uniforms, 2961.
Militia, 1787; army, 149.
Milk, 1787, 418, 741, 1027, 2009; lactometer, 1529.
Milk, Condensed, See Milk, 1787.
Milk Snake, or House Snake, 1788.
Milk-Tester, 742.
Milkweed, 1788, 3115.
Milky Way, or Galaxy, 1788, 1296, 3223.
Mill, 1788; flour, 1019; milling centers, 395, 1798; quern, 2353; rolling, 2437; wind, 3160.
Mill, Henry, 2952.
Mill, James, 1788.
Mill, John Stuart, 1788, 188, 920, 1619.
Millais, Sir John Everett, 1789, 2303.
Miller, Cincinnatus Heine, 1789, 2327.
Miller, Elizabeth Smith, 315. Miller, Elizabeth Smith, 315.
Miller, Hugh, 1789.
Miller, Joaquin, 1789, 89, 3247.
Miller, Louis, 544.
Miller, Rufus W., 382.
Miller, 1789. Miller, Rufus W., 382.
Millet, 1789; hay, 1269.
Millet, Francis Davis, 1789.
Millet, Francis Davis, 1789.
Millet, Jean François, 1789.
Milling in Transit, 2751.
Millinoket, Lake, 3141.
Millipede, 520.
Mills, D. O., 486.
Mills, Roger Quarles, 1790, 723.
Mill Springs, Battle of, 1790, 707.
Millvale, Pa., 1790.
Millville, N. J., 1790.
Milner, Sir Alfred, 1790.
Milo, or Milon, 1790.
Milreis, or Milrea, 1790, 1826. Milo, or Milon, 1790.
Milreis, or Milrea, 1790, 1826.
Milt, or Spleen, 2712.
Miltiades, 1790, 753, 1703.
Milton, Mass., 1791.
Milton, Pa., 1791.
Milton, John, 1791, 919, 3238, 3242, 3252.
Milwaukee, Wis., 1792, 2974.
Mimeograph, 671.
Mimicry, 1792, 1555, 3073.
Mimur's Fountain, 2019.
Minar, The, 777.
Minaret, 1793, 1858.
Minas, or Bello Horizonte, Brazil, 1793. Minaret, 1793, 1858.
Minas, or Bello Horizonte, Brazil, 1793.
Minas Bay, or Basin of Minas, 1793.
Mind, 1793, 1396, 2327, 3150.
Mindanao, Island, 1793, 2187.
Mindoro, Island, 1794, 2187.
Mind Reading, 1764, 2205.
Mineralogy, 1794, 985, 1098, 1526, 1765, 1766.
Mineral Oil, 2025, 2176.
Mineral Water, 1795, 2715, 3100.
Mineral Wax, 3108.

Mineral Wool, or Silicate Cotton, 1795.
Minerva, 1795, 901.
Minerval Festivals, 1795.
Minié, Claude Etienne, 2420.
Minié Rifle, 2420.
Minié Rifle, 2420.
Mining, 1795; air shaft, 43; coal, 609; enginering, 916; fire damp, 1002; gold, 1159; iron, 1400. Mining, Occurrence of, 1795. Minister, 1797, 81; consul, 662. Ministers: cabinet, 425; foreign, 2991; pleni-Ministers: cabinet, 425; toreign, 2991; potentiary, 81.
Mink, 1797, 1079.
Minneapolis, Minn., 1798, 395, 1019, 2974.
Minnehaha Falls, 1799, 3101.
Minnehaha River, 1799, 1798.
Minnesingers, 1799, 1129, 3078.
Minnesota, 1799, 1410, 1021, 2978.
Minnesota, 1799, 1410, 1021, 2978.
Minnesota Point, 840.
Minnesota River, 1799, 1807.
Minnestarees Indians. 742. Minnesota River, 1799, 1807.
Minnetarees Indians, 742.
Minnetonka, Lake, 1798, 1800.
Minnow, 1802, 2506; pink, 1802.
Minorca, 1802, 215.
Minor Prophets, 1803, 288, 2320.
Minos, 1803, 703, 1527.
Minotaur, 1803, 139, 1527, 2862.
Minsk, Russia, 1803.
Mint (herb), 1803, 2025.
Mint, 1803, 620, 2182.
Minto, Gilbert Elliot, 1803.
Minucius (Lucius Minucius), 58 Minucius (Lucius Minucius), 584.
Minuit, or Minnewit, Peter, 1804, 775, 1959.
Minute, 1804, 605, 1328.
Minutemen, 1804.
Miocene, 1804, 1115, 1921.
Miösen, or Mjösen, Lake, 1804, 1997.
Miquelon, Island, 1804.
Mirphany Hoporá Cabriel, 1804, 1708, 2429. Miquelon, Island, 1804.
Mirabeau, Honoré Gabriel, 1804, 1708, 2429.
Mirabilite, 1804; Glauber's salt, 1150.
Miracle, 1804, 286, 1454, 1805.
Miracle Plays, 1805, 2014.
Mirage, 1805, 980.
Miramichi River, 1805, 1934.
Miramón, Miguel, 1805, 1739.
Miriam, 1805, 1483, 1857.
Mirror, 1806, 79.
Mishawaka, Ind., 1806.
Mishna, 1458, 2811.
Missal, 1806, 368.
Mission, 1806; Africa, 32, 1610, 1817; Barnab Missal, 1806, 368.
Mission, 1806; Africa, 32, 1610, 1817; Barnabas, 232; Bible distribution, 289; China, 566, 1854; Corea, 675; Crusades, 716; Fiji Islands, 997; Franciscan, 1052, 2520; Friendly Islands, 1072; India, 838, 1377, 1720; Indians, 360, 902, 1713, 3153; Ireland, 1407, 2123; Lutherans, 1647; McAll Mission, 1654; Methodist, 1769; Moravian Brethren, 1845; Paul, 2125; Polynesia, 2264; Elias Riggs, 2421; Roman Catholic, 2438; Xavier, 3194; Zinzendorf, 3221.
Mississippi, 1808, 649, 1021, 2978.
Mississippi River, 1807, 787, 1987, 2425.
Mississippi Scheme, 1810, 1552.
Mississippi Greece, 1810, 354, 421. Missolonghi, Greece, 1810, 1552.
Missolonghi, Greece, 1810, 354, 421.
Missoula, Mont., 1810, 1835.
Missouri, 1810, 1021, 1412, 2978.
Missouri, University of, 1813.
Missouri Compromise, 1813, 597, 1914, 2211.
Missourie 1813 Missouris, 1813.

Mollah, 1821.

Missouri River, 1810, 2425. Mist, 1024, 2368. Mistletoe, 1813, 2104. Mitchel, Ormsby MacKnight, 1813. Mitchell, S. D., 1814, 2691. Mitchell, Donald Grant, 1814, 89, 2327. Mitchell, Dr. E., 306. Mitchell, John, 1814, 1163. Mitchell, John Hipple, 1814. Mitchell, Maria, 1814, 1239. Mitchell, Mount, 306, 1987, 1990. Mitchell, Silas Weir, 1814, 486. Mite, 1814, 1261, 1423. Mite, General, 847. Miter, 830, 2874. Mitford, Mary Russell, 1815. Mithridates, or Mithradates, 1815, 1643, 2771. Mitylene, or Mytilene, 1574, 2595. Mivart, Saint George, 1815. Mizraim, 1240. Mizzam, 1240.
Mizzenmast, 2616.
Mjösen. See Miösen, 1804.
Moabites, 1815, 202, 1456.
Moabite Stone, 1815, 1813.
Mobile, Ala., 1816, 47, 1355.
Mobile Bay, 1816, 978.
Mobile River, 1816, 47. Mobile Bay, 1816, 978.

Mobile River, 1816, 47.

Moccasin (snake), 1816, 670.

Moccasin, 1816, 2619.

Mocha, 35; coffee, 619.

Mocking Bird, 1816, 2872.

Modder River, 314, 2046, 2681.

Modena, Italy, 1816.

Modern Architecture, 134.

Modica, Sicily, 1817.

Modjeska, Helena, 1817.

Modocs, 1817, 460.

Moero, Lake, 651.

Moesia, 1170, 2870, 3011.

Moesogoths, 1170.

Moffat, Robert, 1817, 1611. Moffat, Robert, 1817, 1611. Mogul, 1817, 1377. Mogul, 1817, 1377.

Mohács, Hungary, 1817, 2674.

Mohair, or Camlet, 1817, 2240.

Mohammed, 1817, 125, 1745, 2394.

Mohammed II., of Turkey, 1818, 660, 2943.

Mohammed V., 5, 2944.

Mohammed Ali. See Менемет Ал, 1750.

Mohammed Ali. See Менемет Ал, 1750.

Mohammedanism, 1819, 70, 258, 423, 432, 786, 1483, 1518, 1745, 1844, 1858, 2394, 2528; Ваьі ists, 203.
Mohave, 1819, 3214.
Mohawk River, 1819, 1956; Mohawks, 1819, 360.
Mohicans, or Mohegans, 1820, 2156.
Mohl, Jules, 1001.
Mohs, Friedrich, 1794, 1795.
Mojave Desert, 438.
Moki, or Hopi, 1820.
Molasses, 1820, 2677.
Mold, 1820, 1078.
Moldau River, 1820, 323 Moldau River, 1820, 323.

Moldavia. See Rumania, 2460.

Mole, 1820; shrew mole, 2622.

Molech, 1822, 202.

Mole Cricket, 1820, 704. Molecule, 1821, 180, 517, 2277.
Moleschott, Jacob, 1734. Molière, Jean Baptiste, 1821, 826, 2362. Moline, Ill., 1821, 1367. Molino del Rey, Battle of, 1821, 97, 533.

Molliendo, Peru, 136. Mollusca, 1821, 105, 693, 1882. Mollusks, 1115, 1821, 3225. Molly Maguires, 1822, 2219. Moloch, or Molech, 1822, 202. Molokai, Island, 1822, 1265, 1573. Molting, 297, 698, 982, 1613, 2664. Moltke, Helmuth Karl Bernhard, 1822, 3071. Moluccas, or Spice Islands, 1823, 1683.

Molybdenum, 547, 1766.

Mombasa, or Mombaz, Africa, 1823, 378, 2447.

Momentum, 1823, 849, 3135. Mommsen, Christian Matthias Theodor, 1823. Mommsen, Christian Martinas Theodor Mompós, or Mompox, Colombia, 1823. Momus, 1824. Monachism. See Monastery, 1824. Monaco, 1824, 1423. Monarchy, 1824, 2438, 2857. Monastery, or Bitolia, Macadonia, 1825. Monastir, or Bitolia, Macedonia, 1825. Monbuttu, or Mangbuttu, 1825. Moncton, New Brunswick, 1825, 1935. Monday, 1825, 1312, 3116. Monet, Claude, 1825. Money, 1825, 73, 294, 310, 403, 478, 727, 728, 2096, Money, Hermando de Soto, 1826. Mongolia, 1826, 563. Mongolians, 1826, 941, 2822; Laos, 1542. Mongols, 1826, 2626. Mongose, 1827; ichneumon, 1359. Mongrel, 1346. Monier-Williams, Sir Monier, 1827. Monism, 1157; pantheism, 2007 Monism, 1157; pantheism, 2097. Monitor, 1827; lizard, 1611. Monitor (vessel), 1827, 1245, 1911. Monk, George, 1828, 536. Monkey, 1828, 116, 203, 562, 1167, 1569. Monmouth, Battle of, 1829.
Monmouth, Ill., 1828.
Monmouth, James, Duke of, 1829, 1711.
Monmouth's Rebellion, 1447. Monnier, Marcel, 1048. Monocotyledon, 688. Monogamy, 1714, 2264.
Monomania, 1829; insanity, 1392.
Monometallism, 1829, 294.
Monongahela, Pa., 1830.
Monongahela River, 1829, 71, 2150. Mononganela River, 1829, 71, 2150. Monopoly, 1830; trusts, 1830, 2929. Monotheism, 1830, 2265, 2394. Monotremata, 1830, 190, 1688, 1717. Monotype, 1831, 2313, 2951. Monroe, Fortress, 1037, 1245. Monroe, La., 1831, 1636. Monroe, Mich., 1831. Monroe, Lames, 1831, 1832, 2976. Monroe, James, 1831, 1832, 2976. Monroe Doctrine, 1832, 2257. Monrovia, Liberia, 1832, 1582. Monrovia, Liberia, 1832, 1582.
Mons, Belgium, 1832.
Monsoon, 1832, 3160.
Montagu, Lady Mary Wortley, 1832.
Montague, Mass., 1833.
Montaigne, Michel Eyquem de, 1833, 1048.
Montana, 1833, 1021, 2978.
Montana, University of, 1835.
Mont Blanc, 1835, 1760.
Montcalm, Louis Joseph, 1835, 2350, 2876, 3174.
Mont Cenis Tunnel, 2935.
Mont Cervin, 1735.
Montclair, N. J., 1836.

Montebello, Battle of, 1541. Monte Carlo, Monaco, 1836, 1824. Monte Corno, 117. Montecuccoli, Count Raimund de, 2943. Montefiore, Sir Moses, 1836. Montenegre, 1836, 215, 282, 950. Monterey, Battle of, 1837, 1771. Monterey, Bay of, 437, 2966. Monterey, Mexico, 1837, 1775. Montesquieu, Charles, 1837, 1048, 3236. Montessori Method, 1891. Monteverde, Claudio, 1837. Montevideo, Uruguay, 1837, 3004. Montevideo, Uruguay, 1837, 3004.
Montezuma I., of Mexico, 1838, 1772.
Montezuma II., of Mexico, 1838, 201, 684.
Montfort, Simon de, 1838, 921.
Montgolfier, 1838, 217, 1348.
Montgomery, Ala., 1838, 2978.
Montgomery, James, 3236.
Montgomery, Richard, 1839; Month, 1839, 763.
Montgomery, 826, 1422. Monti, Vincenzo, 826, 1422. Monticello, 1839, 540. Montiel, Battle of, 2140. Montigny, Abbé de, 1550. Montluçon, France, 1839. Montmorency, Anne, Duke of, 1839.
Montmorency, Falls of, 1840.
Montpelier, Vt., 1840, 2978.
Montpellier, France, 1840.
Montreal, Island, 1841, 1840.
Montreal, Quebec, 1840, 268, 2350.
Montrose, Duke of, 842, 2430.
Montrose, James Graham, 1841. Montrose, James Graham, 1841. Monts, Pierre du Gast. See De Monts, 780, 11. Montserrat, Island, 1841, 1562. Montt, Manuel, 1841. Moody, Dwight Lyman, 1842, 313, 2522. Moody, William Henry, 1842. Moon, 1842, 118, 866, 1240, 2534. Moonfish, or Mariposa, 2041, 2609. Moonshiners, 2662. Moonstone. See Felspar, 985. Moonstone. See Felspar, 985.

Moor, Josiah, 755.
Moore, George, 1843.
Moore, Sir John, 1843, 2148.
Moore, Thomas, 1843, 920, 3235, 3240, 3243.
Moors, 1844; Alhambra, 69; architecture, 133; in Spain, 126, 2697; Mauritania, 1738.
Moose, 1844, 771, 904.
Moosehead Lake, 1845, 1679.
Moosejaw, Saskatchewan, 2534.
Moraes-Barros, Prudente José de, 1845.
Moraine, 1845, 1145.
Morality Plays. See Mysteries, 1885.
Moral Science, 939; moral culture, 872.
Moran, Patrick Francis, 1845.
Moran, Thomas, 1845.
Moravia, 1845, 195.
Moravia, 1845, 195. Moravian Brethren, 1845, 3122, 3218, 3221. Moray, James Stuart, 1846, 1724, 2564. Moray Firth, 1846, 435. Mordants, 1846, 849, 1150. Mordecai, 938. More, Hannah, 1846. More, Sir Thomas, 1846, 919, 1287, 2950, 3007. Moreau, Jean Victor, 1847, 1870, 1895. Morehead, J. T., 13. Morelia, or Valladolid, Mexico, 1847. Morelos, José Maria, 1733. Morgan, Daniel, 1847, 692. Morgan, Edwin Dennison, 1847. Morgan, Henry, 1847, 392.

Morgan, Henry James, 1847. Morgan, John Hunt, 1847. Morgan, John Hunt, 1847.

Morgan, John Pierpont, 1848, 3198.

Morgan, John Tyler, 1848.

Morgan, Junius Spenser, 1848.

Morgan, Thomas Jefferson, 1848.

Morgarten, 1848, 2759, 2839.

Morghen, Raffaello Sanzio Cavaliere, 1848.

Moriah, Mount, 1848, 1451.

Moriscos, 1844, 2697.

Morley, Henry, 1849.

Morley, John, 1849, 920.

Mormons, 1849, 392, 1368, 2508, 3210.

Mormon Temple, 2508, 3210.

Morning Glory, 1851, 3115.

Morocco, 1851, 33, 1738.

Morocco, Morocco, 1851.

Morocco, See Leather, 1556.

Moros, 2191, 2773.

Morpheus, 1852; sleep, 2652. Morpheus, 1852; sleep, 2652. Morphie, or Morphia, 1852, 2042. Morphology, 1852, 297, 347. Morrill, Justin Smith, 1852. Morrill Tariff, 1852, 2321, 2820. Morris, Clara, 1853. Morris, Clara, 1853.
Morris, George Pope, 826.
Morris, Gouverneur, 1853, 2989.
Morris, Lewis, 2995.
Morris, Sir Lewis, 1853.
Morris, Robert, 1853, 2989, 2995.
Morris, William, 1853, 920, 3054.
Morris Island, 404.
Morrison, Mount, 1034 Morrison, Mount, 1034.
Morrison, Frank, 1163.
Morrison, Robert, 1853.
Morrison, William Ralls, 1854.
Morristown, N. J., 1854, 1945.
Morrow, William W., 486.
Morse, Edward Sylvester, 1854.
Morse, Samuel, 1854, 1239, 2835.
Mortality, Statistics of 1855, 139 Mortality, Statistics of, 1855, 1396. Mortar, 158, 463, 2806. Mortar. See CEMENT, 518. Mortgage, 1855; chattel, 543. Mortimer, Roger, 877. Morton, John, 2995. Morton, Julius Sterling, 1855, 129, 1031. Morton, Levi Parsons, 1855, 2976. Morton, Oliver Perry, 1855. Morton, Oniver Ferry, 1855.

Morton, Paul, 1856.

Morton, William James, 1856.

Mosaic, or Mosaic Work, 1856; painting, 1856.

Mosaic Glass Painting, 1856, 1150.

Mosby, John Singleton, 1856.

Moselve of Sider 1856. Moschus of Sidon, 180. Moscow, Idaho, 1856. Moscow, Russia, 1856, 268, 1424, 1895. Moselle River, 1857, 2406. Moses, 1857, 288, 1455, 1805. Moskenäs, Islands, 1672. Moslem, 716, 1818, 2007. Mosque, 1858: Mohammed Ali 439 Moslem, 716, 1818, 2007.
Mosque, 1858; Mohammed Ali, 432; Omar, 1452; Saint Sophia, 133, 660; Soliman, 660.
Mosquito, 1858, 1394, 1683, 3204.
Mosquito Territory, or Mosquitia, 1859, 1970.
Mossamba, Lake, 103.
Mosses, 1859; Irish Moss, 1409, 1859.
Most, Johann Joseph, 1859, 95.
Moszkowski, Moritz, 1859.
Mother Cary's Chickens, 2176.
Mother-of-Pearl, 2, 2134, 2610.
Moths, 1859, 506, 1126, 2947.

Motion, Laws of. See DYNAMICS, 849. Motley, John Lothrop, 1860, 88, 1605. Motmot, 1860. Motor, 644, 850; motor car, 895. Motor Bicycle, 290. Motor Organ, 2053. Motory Nerves, 1923. Mott, Lucretia Coffin, 1860, 2726. Mott, Valentine, 1860, 1964. Mott, Valentine, 1860, 1964.
Moulins, M. Charles des, 123.
Moulton, Ellen Louisa, 1860.
Moultrie, Fort, 97, 2772.
Moultrie, William, 1860.
Mound Bird, 1861, 389.
Mound Builders, 1861, 2220.
Moundsville, W. Va., 1862.
Mountain, 1862, 857, 3060.
Mountain Ash, or Rowan Tree, 1862.
Mountain of Moses, 2640.
Mountain Time, 2722.
Mountains of the Moon, 1843. Mountains of the Moon, 1843.

Mount Auburn Cemetery, 518.

Mount Blanc, 1835, 76.

Mount Carmel, Pa., 1862.

Mount Clemens, 1862.

Mount Desert, Island, 1862, 230.

Mount Everest, 164, 1302, 1862.

Mount Holyoke College, 1862, 1314, 1651,

Mount Lebanon, N. Y., 2602.

Mount Nebo, 1858, 1920.

Mount San Francisco, 142.

Mount Sinai, 2640, 1858.

Mount Sterling, Ky., 1863.

Mount Vernon, Ill., 1863.

Mount Vernon, Ind., 1863.

Mount Vernon, N. Y., 1863.

Mount Vernon, N. Y., 1863.

Mount Vernon, N. Y., 1863.

Mount Vernon, Va., 1863, 3035, 3096.

Mount Washington, 1940, 1987.

Mount Whitney, 438. Mountains of the Moon, 1843. Mount Whitney, 438.

Mouse, 1863, 1449, 2376; dormouse, 818; hamster, 1245; shrew, 2622.

Mouth, 1864, 95, 1732, 2505. Mouth, 1804, 95, 1732, 2505.

Mowing Machine, 1864; reaper, 2382.

Moyse, Charles E., 1864.

Mozambique, or Portuguese East Africa, 2288.

Mozart, Johann, 1864, 1130, 1879, 2041.

Mucilage, 1865; gum, 1218.

Mucus, 1865; membrane, 1754.

Mudfish, 1865.

Mud hen, 668 Mud hen, 668. Muezzin, or Mueddin, 1865, 1793.

Mugwump, 1865.

Muhlerg, Battle of, 537, 2552.

Mühlenberg, Frederick Augustus Conrad, 1965.

Mühlenberg, Heinrich Melchior, 1866.

Mühlenberg, William Augustus 1866, 84, 86. Mühlenberg, William Augustus, 1866, 84, 86. Mühlenberg College, 1866, 72. Mühlhausen, Germany, 1866, 2134. Muir, John, 1866. Muir Glacier, 1866, 49, 1146, 1845. Mukden, or Moukden, Manchuria, 1866, 1442, Mukhtar Pasha, 703. Mulahacen, Mount, 2694. Mulatto. See Negro, 1918. Mulberry, 1867, 2636. Mule, 1867, 168; hybrid, 1346. Mule, Spinning, 710. Mulgrave, Lord, 2248.

Mülhausen, Germany, 1867. Mullein, 1867; weeds, 3115. Mullens, Priscilla, 59, 2724. Müller, Gerhardt F., 2470. Müller, Gernardt F., 2410.

Müller, Johann, 2741.

Müller, Johannes, 3225.

Müller, Max. See Max-Müller, 1740.

Müller, O. F., 795.

Mullet, 1868; surmullet, 1868. Mulock, Dinah Maria, 696. Mulready, William, 1868. Multiplex Telegraph, 1185, 2835. Multiplication, 141; notation, 2000. Mummy, 1868, 909, 2372. Mumps, 1869; saliva, 2505. Munchlausen, Karl, Baron von, 1869. Muncie, Ind., 1869, 1379. Munger, Theodore Thornton, 3252. Munich, Germany, 1870, 1128. Munich, University of, 1870, 2997. Municipal Government, 1870, 588, 2253. Municipal Government, 1871, 3104. Munkácsy, Mihály, 1872. Munroe, Kirk, 1872. Muss, Mohammed Ben, 66; Munsee, 1872. Münster Germany, 1979, 2109 Münster, Germany, 1872, 3128. Münsterberg, Hugo, 1872. Muntjack, 771. Munzer, Thomas, 93. Muradabad, or Moradabad, 1872. Murat, Joachim, 1872, 1423, 1894. Murchison, Mount, 452. Murchison, Sir Roderick, 1873, 1114. Murchison Falls, 3046. Murcia, Spain, 1873, 2696. Murder, 1873, 1316. Murder, 1873, 1316.

Murdock, James Edward, 1873.

Murdock, William, 1873.

Murfree, Mary Noailles, 1874.

Murfreesboro, Tenn., 1874, 356.

Muriatic Acid, 1349, 2672.

Murillo, Bartolomé Estéban, 1874, 2081, 3026.

Murphy, John B., 1875.

Murphysboro, Ill., 1874.

Murray, or Moray, Earl of, 1846.

Murray, David Christie, 1875.

Murray, James Ormsby, 1875.

Murray, John Clark, 1875.

Murray, Lindley, 1875.

Murray River, 1875, 188, 2425.

Murrumbidgee River, 1875, 188. Murrumbidgee River, 1875, 188. Muscat, or Maskat, Oman, 1875, 125. Muscat, or Maskat, Oman, 1875, Muscatine, Iowa, 1875, 1403. Muscle, 1876, 332, 2207, 2646. Muscle Reading, 1764. Muskogee, Okl., 1877, 2028, 2933. Muscovites, 2471, 2788. Muscovy. See Russia, 2466. Muscovy Duck, 837. Muscular Sense, 1878, 2588. Musca 1878, 441, 1280 Muscular Sense, 1878, 2588.

Muses, 1878, 441, 1280.

Museum, 1878, Ashmolean, 2072; Athens, 176;
Berlin, 281; British, 378; Field, 554; Louvre, 1639, 2106; Rome, 2441; Smithsonian, 2661.

Mushroom, 1878, 1079.

Music, 1879, 1, 77, 262, 282, 401, 403, 572, 847, 868, 1130, 1171, 1246, 1254, 1255, 1270, 1596, 1601, 1651, 1661, 1664, 1755, 1864, 2068, 2078, 2124, 2346, 2459, 2556, 2557, 2771, 3069, 3113.

Musk, 1881, 2158. Musk Deer, 1881, 771. Muskegon, Mich., 1881, 1780. Musket, 1881, 149, 1203, 1218. Muskhogean, 1881. Muskhogean, 1881.
Muskingum River, 1881, 2022.
Muskmelon, 1881, 1172, 1753.
Musk Ox, 1881, 1882.
Muskrat, 1882, 2598, 3061.
Muslin, 1882, 437.
Musquash. See Muskrat, 1882.
Musschenbrock, Pieder van, 892.
Musschenbrock, Pieder van, 892, 1580.
Mussel, 1882, 303, 420, 1822, 2133.
Musset Alfred de, 1883. Musset, 1882, 303, 420, 1622, 2135. Musset, Alfred de, 1883. Mustang. See Broncho, 380. Mustapha, 8, 1977. Mustard, 1883, 702, 1900, 3115. Mutiny, Sepoy, 1377, 1643. Mutiny Act, or Army Act, 1883. Mutoscope, 1883, 1508. Mutsubite, of Japan, 1883, 1442. Mutsuhito, of Japan, 1883, 1442, 1982. Mutton, 1884, 2608. Mycenae, Greece, 1884, 2552. My Country 'Tis of Thee, 2659. Myer, Albert J., 2633. Myers, Frederic William Henry, 1884. Myopia, 1884, 963. Myriapoda, 1884, 520. Myrmidons, 1884. Myrrh, 1884, 1218, 2158. Myrsilus, 56.
Myrsle, 1885, 1021.
Mysore, or Maisur, India, 1885.
Mysteries, 1885, 790, 900.
Mystic Circle, The Fraternal, 274. Mysteries, 1885, 790, 900.

Mystic Circle, The Fraternal, 274.

Mysticism, 1885; theology, 2859.

Mythology, 1885; Acheron, 14; Adonis, 23; Aeolus, 26; Aesop, 27; Agamemnon, 33; Ajax, 45; Amazons, 80; Andromache, 100; Antaeus, 109; Apollo, 118; Atlantis, 179; Bacchus, 205; Calypso, 443; Cassandra, 498; Centaur, 520; Circe, 585; Cupid, 725; Cyclops, 734; Daedalus, 739; Danaides, 748; Deucalion, 790; Diana, 794; Dryades, 834; Echo, 864; Fates, 980; Flora, 1015; Fortuna, 1038; Ganymede, 1094; Golden Fleece, 1160; Gorgons, 1167; Halcyon, 1235; Harpies, 1255; Hebe, 1276; Hecuba, 1277; Helicon, 1280; Hercules, 1291; Hesperides, 1296; Idol, 1363; Iphigenia, 1404; Iris, 1409; Isis, 1416; Ixion, 1426; Janus, 1437; Jason, 1443; Jotuns, 1472; Juno, 1479; Laocoön, 1541; Lares, 1544; Lethe, 1575; Lotus, 1630; Mars, 1714; Medusa, 1750; Memnon, 1754; Mercury, 1759; Mermaid, 1762; Midas, 1783; Minerva, 1795; Minotaur, 1803; Morpheus, 1852; Muses, 1878; Narcissus, 1897; Nemesis, 1921; Neptune, 1921; Niobe, 1978; Nymphs, 2010; Odin, 2019; Orestes, 2052; Orion, 2054; Orpheus, 2057; Osiris, 2060; Pan, 2091; Paris, 2103; Pesgasus, 2140; Pelops, 2144; Penelope, 2147; Peri, 2159; Perseus, 2162; Phaëthon, 2178; Phoenix, 2198; Pleiades, 2237; Pluto, 2241; Polyphemus, 2265; Pomona, 2266; Poseidon, Peri, 2159; Perseus, 2162; Phaëthon, 2178; Phoenix, 2198; Pleiades, 2237; Pluto, 2241; Polyphemus, 2265; Pomona, 2266; Poseidon, 2289; Priam. 2307; Prometheus, 2319; Proserpina, 2321; Psyche, 2327; Pygmalion, 2338; Romulus, 2446; Saturn, 2535; Scylla and Charybdis, 2570; Semele, 2584; Sibyls, 2626; Sirens, 2643; Sphinx, 2706; Styx, 2765; Tantalus, 2815; Themis, 2857; Thetis, 2862; Tantalus, 2815; Themis, 2857; Thetis, 2862;

Thor, 2868; Titans, 2883; Triton, 2922; Uranus, 3000; Venus, 3030; Vesta, 3039; Vulcan, 3065; Woden, 3173; Zeus, 3219. Mytilene. See Lesbos, 1574.

N

N, 1887, 2951. N, 1887, 2951.
Nabonassar, Era of, 1887; Age, 35.
Nabonidus, 205, 272.
Nabopolassar, 1887, 1978.
Nachtigal, Gustav, 1887.
Nacre, or Mother-of-Pearl, 2133.
Nadir, 1887, 2252.
Nadir, Shah, 1887, 29.
Naggashi Japan, 1888, 1441. Nagasaki, Japan, 1888, 1441. Nagoya, Japan, 1888. Nagpur, India, 1888, 1377. Nahum, 1888, 289, 2320. Naiads, 1888, 2010. Nails, 1888, 1325. Nails (physiology), 1889, 853, 2648. Namaqualand, 1889. Name, 1889; pseudonym, 2326. Namur, Belgium, 1889. Nanaimo, British Columbia, 1890. Nanak Shah, 2634. Nana Sahib, 1890, 1265. Nancy, France, 1890. Nankeen, 1890. Nanking, or Nankin, China, 1890, 567. Nansen, Frithjof, 1890, 135, 2249. Nantes, France, 1891, 1047. Nantes, Edict of, 1891, 1288, 1334, 1632. Nanticoke, Pa., 1891. Nantucket, Mass., 1891, 1727. Noami, 2477. Noami, 2477.
Noaroji, Dadabhai, 1891.
Napata, 940.
Naphtali, 1891, 1455.
Naphthali, 1892, 277, 2177.
Naphthalene, 1892; hydrocarbon, 1349.
Napier, New Zealand, 1892.
Napier, Sir Charles James, 1882.
Napier, John, 1882, 1618.
Napier, Robert Cornelius, 1882, 3236.
Napier, Sir William Francis Patrick, 1893.
Naples, Italy, 1893; cabal of, 814; lazzaroni, 1554; university, 2997.
Naples, Bay of, 1893, 1416.
Naples, Kingdom of, 1893, 2628. Naples, Bay of, 1893, 1416.
Naples, Kingdom of, 1893, 2628.
Napoleon, Victor Jerome Frederick, 1894.
Napoleon I., 1894, 187, 317, 1110, 1472, 1706, 1857, 2491, 3102, 3120, 3236, 3238.
Napoleon II., 1896, 1707, 2392.
Napoleon III., 1896, 1050, 1132, 2578, 3152.
Napo River, 80.
Narbada, or Nerbudda River, 1922.
Napone France 1897 Narbonne, France, 1897. Narcissus, 1897, 740, 864. Narcissus (botany), 1897, 740, 1021. Narcotic, 1898, 1692, 2246, 2888. Nard. See Spikenard, 2708. Nares, Sir George Strong, 527. Narragansett Bay, 1898, 2407. Narragansetts, 1898. Narrows, The, 1959, 2730. Narses, 1898. Narva, Battle of, 538. Narváez, Panfilo de. 1898.

Narváez, Ramón Maria, 1898.
Narwhal, 1898, 813, 2960.
Nasby, Petroleum V. See Locke, 1614.
Nascimento, Manoel de, 2287.
Naseby, Battle of, 536, 710, 1898.
Naseby, England, 1898.
Nashua, N. H., 1899, 1942.
Nashville, Tenn., 1899, 2844.
Nashville, Battle of, 1899, 1318.
Nashville, University of, 1899, 2844.
Nasmyth, James, 1900, 2735.
Nasr-Ed-Den, 1900.
Nast, Thomas, 1900, 482. Nast, Thomas, 1900, 482. Nasturtium, 1900; cress, 702. Natal, 1900, 33, 322. Natalie, 1901. Natatores, 298. Natchez, Miss., 1901, 1809. Nathan, 2101. Natick, Mass., 1901. Natick, Mass., 1901.
National Academy of Design, 1902.
National Academy of Sciences, 1902.
National Banks, 226, 727.
National Cemeteries, 518.
National Civic Federation, 1902.
National Debt, 1902, 767.
National Guard, 1903, 1787.
National Hymn, 1903, 1715, 3067.
Nationalist, 1904, 2113.
National Library. See LIBRARY of CONGRESS, National Monument, or the Denkmal, 1904. National Monument, or the Denkmal, 1904. National Museum of the United States, 1904. National Park. See Yellowstone Park, 3204. National Provident Union, 274. National Road, 2426; highway, 1300. Natural Bridge, 1904. Natural Gas, 1904, 1101. Natural History, 1905, 34, 414, 1169, 1336, 1345, 2558, 2868. 2558, 2868.
Naturalization, 1905, 69, 587.
Natural Selection, 1905, 756.
Natural Theology, 1906.
Nature Study, 1906; ant, 108; bee, 258; beetle, 263; birds, 297; boa, 319; butterfly, 419, 1859; caterpillar, 506; color, 629; corn, 678; cotton, 686; crab, 694, 698; fish, 1004, 1000; gnat, 1154, 1858; flower, 1020, 1630, 2450; fox, 1042, 2404; grain, 231, 678, 2013, 2478, 3133; grass, 1182, 2090, 2880; palms, 2088, 2087; poultry, 2297, 837, 1164, 1216, 2784; 2085; grass, 1162, 2090, 2880; paims, 2088, 2087; poultry, 2297, 837, 1164, 1216, 2784; silkworm, 2636; spider, 2707, 2818; stock (domestic), 446, 511, 1323, 2607, 2792, 3216; worms, 506, 858, 1152, 2816.

Nature Worship, 1907; God, 1156. Nature Worship, 1907; God, Naugatuck, Conn., 1907. Nausets, Indians, 1907, 1730. Nautical Almanac, 74, 1307. Nautilus, 1907, 732, 1822. Nauvoo, Ill., 1908, 1368, 1850. Navajoes, or Navahos, 1908. Naval Academy, 1908, 106, 428. Naval Consulting Board, 871. Naval Observatory, 1908, 2839. Naval Reserve, or Naval Naval Militia, militia, 1787. Naval Schools, 1908, 106, 1951. Navarino, or Neocastro, Greece, 1909. Navarino, Battle of, 1909, 2944. Navarra, or Navarre, 1909, 1288, 1706. Navarro, Mary Antoinette Anderson, 1909. Navel, 1909. Navigation, 1909; boat, 320; compass, 643; log,

1617; projection, 1759; quadrant, 2343; rud-der, 2459; ship, 2616; steamboat, 2732. Navigation, United States Bureau of, 75. Navigation Acts, 1910. Navigation Acts, 1910.
Navigator's Islands, 2264, 2612.
Naville, Edourd Henri, 1910.
Navy, 1910; Monitor, 1827; ship, 2616; war ship, 3087.
Navy, Department of, 2991.
Navy Signaling, 2633. Nazarenes, 1911, 1292. Nazareth, Palestine, 1912, 1453. Nazarites, 1912, 1513. Neander, Johan August, 1130. Neapolis, Italy, 1893. Neap Tides, 2876. Nearsightedness, or Shortsightedness, 963, 1884 1884. Neat's-foot Oil, 2025. Nebo, Mount, 1912, 1858. Nebraska, 1912, 1021, 2978. Nebraska, University of, 1914, 1594, 2997. Nebraska City, Neb., 1914. Nebraska State Normal School, 1914. Nebuchadnezzar, 1915, 205, 1247, 1451, 1456, 2953. Nebula, 1915, 1296. Nebular Hypothesis, 1915, 2672. Necho, or Neku, 1916, 1472. Neckar River, 1916, 2406. Necker, Jacques, 1916, 1633, 2720. Necromancy, 1916, 805. Necropolis, 1916; cemetery, 518. Nectar, 1916, 81. Needle, 1916, 2598. Needle Gun. See Rifle, 2420. Neenah, Wis., 1917. Negaunee, Mich., 1917. Negligence, 1917. Negligence, 1917.
Negritos, or Negrillos, 1918.
Negro, Rio, 2423, 2054.
Negroes, 1918; facial angle, 966, 941; Kafirs, 1484; in Liberia, 1582; slavery, 2650; in United States, 2974; Zulus, 3226.
Negros, Island, 1919, 2187.
Nehemiah, 1919, 289, 1451, 1456.
Neill Edward Duffield, 1919. Neill, Edward Duffield, 1919. Nelson, British Columbia, 1919, 377. Nelson, England, 1919. Nelson, New Zealand, 1919. Nelson, Horatio, 1920, 219, 1895, 1977, 2908. Nelson, Jr., Thomas, 2995. Nelson, William, 1920. Nelson River, 1919, 452, 3163. Nelsonville, Ohio, 1920. Nelumbium, or Nelumbo, 1920; lotus, 1630. Nemean Games, 1920, 991, 1093, 1790. Nemesis, 1921. Neocene, 1921; geology, 1115. Neolithic Man, 2749. Neon (chemistry), 547. Neo-Platonism, 2196, 2553. Neosho River, 1921, 1489. Nepal, or Nipal, 1921, 2960. Nephrite, 1921. Nepomuk, Saint John of, 1921. Nepomuk, Saint John of, 1921. Nepos, Cornelius, 1921. Neptune, 1921, 901, 2289, 2322. Neptune (planet), 1921, 1577, 2231, 2534. Nerbudda, or Narbada, River, 1922. Nereids, 1922, 2010. Nereus, 1922, 2057.

Neri, Saint Filippo de, 2047. Nerinck, Charles, 1628. Nero, Lucius Domitius, 1922, 2444, 3238. Nerva, Marcus Cocceius, 1922, 2444. Nerves, 1922, 358, 2708; optic nerve, 962; ganglion, 1094. Nervous System, 1923, 2208. Nessus, 1291; Centaur, 520. Nest, 1923, 298, 1861, 2744. Nestor, 1924. Nestor, 1924.
Nestorians, 1924, 575, 2394, 2802.
Nestorians, 1924, 575, 2394, 2802.
Nestorius, 1924.
Net, 1924, 1006.
Netherlands, or Holland, 1924; Amsterdam, 92; Belgium, 265; Boer, 322; Burgundy, 408; colonies, 341, 516, 1444, 1823, 1926, 1940, 2774; East India Companies, 860; Flanders, 1011; language, 847, 1927; literature, 1927; navy, 1910; polder, 2252; pottery, 92, 777, 2295; Quadruple Alliance, 2343; universities, 1207, 2997, 3008; wars, 1895, 1927, 2186, 2979.
Nethersole, Olga, 1927.
Nettle, 1928, 2058.
Nettle Rash, 1928.
Neuchâtel, Lake of, 1928, 2793.
Neuchâtel, Lake of, 1928, 2793.
Neuchâtel Cheese, 545.
Neumecklenburg, Island, 1928, 301. Neumecklenburg, Island, 1928, 301. Neuralgia, 1928 Neurasthenia, 1928.
Neurasthenia, 1928.
Neuroptera, 1928.
Neuroptera, 1929.
Neustria, 1929, 1011.
Neutrality, 1929, 3080.
Neuville, Alphonse Marie de, 1929.
Nevada, 1929, 1021, 2978.
Nevada, 1929, 1021, 2978.
Nevada, Mo., 1931.
Nevada State University, 1932.
Neva River, 1929, 1529.
Nevers, France, 1932.
Nevin, Ethelbert, 1932.
Nevis, Ben, 2561.
Nevis, Island, 1932, 1562.
New Albany, Ind., 1932, 1380.
New Amsterdam, 1963, 2764, 2979.
Newark, N. J., 1932, 2974.
Newark, Ohio, 1933, 1861.
New Bedford, Mass., 1933.
Newberny, John Strong, 1933.
Newberry, John Strong, 1933.
Newberry Library, 554.
New Brighton, Pa., 1933.
New Britain, Conn., 1933.
New Britain, Conn., 1933.
New Brunswick, 1934, 457, 2001.
New Brunswick, 1934, 457, 2001.
New Brunswick, 1934, 457, 2001.
New Brunswick, N. J., 1936,
Newburgh Addresses, 1936.
Newburgh Addresses, 1936.
Newburgh Addresses, 1936.
New Caledonia, Island, 1936, 1641, 2264.
Newcastle, New South Wales, 1936, 1952.
New Castle, Pa., 1936, 2151.
Newcastle-upon-Tyne, England, 1937, 918.
Newcomen, Thomas, 1937.
Newell, Robert Henry, 1937, 2327.
New England, 1937, 2337. Neurasthenia, 1928. Neuritis, 1928 Newell, Robert Henry, 1937, 2327. New England, 1937, 2337. New England Order of Protection, 274. New Forest, 3151. Newfoundland, 1937, 375, 452, 1526. Newfoundland Dog, 1939, 811. New France, 457.

Newgate, 1939. New Granada, 327, 627, 3196. New Guinea, or Papua, 1940, 2264. New Hampshire, 1940, 1937, 2978. New Haven, Conn., 1942, 2975. New Hebrides, Islands, 1943, 2264 New Hope Church, Battle of, 2614. New Iberia, La., 1943, 1636. New Jersey, 1943, 2978. New Jerusalem Church, 2789. New Jerusalem Church, 2789.
Newlands, Francis Griffith, 1946.
New London, Conn., 1946, 656.
Newman, Francis William, 1946.
Newman, John Henry, 1946, 920, 1353, 2337
New Mexico, 1946, 2978.
New Mexico, University of, 1948.
New Netherlands, 2764.
New Orleans, La., 1948, 978, 1429, 2974 New Mexico, University of, 1948.

New Netherlands, 2764.

New Orleans, La., 1948, 978, 1429, 2974.

New Orleans, Battle of, 1950, 2980.

New Philadelphia, Ohio, 1950.

New Pommern Island, 2264.

Newport, England, 1951.

Newport, Ky., 1950.

Newport, R. I., 1951, 2409.

Newport News, Va., 1951, 1245, 3056.

New Red Sandstone, 1951, 2030.

New Rochelle, N. Y., 1951.

New Siberia, or Liakhov, Islands, 1951, 2625.

New South Wales, 1951, 190, 2797.

New Spain, 684, 1775.

Newspaper, 1953, 169, 1473, 2160.

Newt, or Eft, 1953, 2502.

New Testament, 288, 575, 1169, 2403.

Newton, Kans., 1954.

Newton, Mass., 1954, 1729.

Newton, Hubert Anson, 1954.

Newton, John, 1955.

New Westminster, British Columbia, 1955, 377.

New Whatcom. See Bellingham, 271.

New Whatcom. See Bellingham, 271. New Westminster, British Columbia, 1955, 377.

New Whatcom. See Bellingham, 271.

New Year's Day, 1955, 1311.

New York, 1956, 1021, 2978, 2979.

New York, N. Y., 1959, 1804; Associated Press, 169; Astor Library, 172, 1961; Bedloe's Island, 258; Bowery, 2764; bridges, 372, 1962; Brooklyn, 381; Castle Garden, 501; Central Park, 522, 1960; Cooper Union, 667; Croton Aqueduct, 124; Hell Gate, 1282; obelisk, 2013, 1960; police, 2254; Tammany Society, 2812; Tweed Ring, 2948; university, 1961; population, 1964.

New York, Bay of, 1332, 1959.

New York, College of the City of, 1964.

New York Public Library, 1584, 1961.

New York University, 1964, 1961.

New York University, 1964, 1961.

New York World, 169, 2332.

New Zealand, 1965, 188, 1135.

Ney, Michel, 1966.

Nez Percés, or Shahaptians, 1967, 1329.

Ngami, Lake, 1967, 1611.

Niagara Falls and River, 1967, 466, 892, 2040, 3101, 3119.

Niagara Falls Water Power, 892. 3101, 3119. Niagara Falls Water Power, 892. Niagara Series, 1968, 2637. Nibelungenlied, 1968, 295, 1129, 2439. Nicaea, or Nice, Asia Minor, 1969, 2943. Nicaragua, 1969, 521, 1970. Nicaragua, Lake of, 1970, 1969.

Nicaragua Canal, 1970. Nicator, Seleucus. 2581: Nice, France, 1970. Nice, or Nicaea. Councils of, 1970, 659. Nice, or Nicaea. Councils of, 1970, 659.

Nicene Creed. 1970, 701.

Nicephorus Phocas II., 703.

Nicholas, Grand Duke, 1971.

Nicholas II., of Rome, 1971, 2200, 2273.

Nicholas III., of Rome, 1971.

Nicholas III., of Rome, 1971.

Nicholas IV., of Rome, 1971, 79, 2274.

Nicholas IV., of Rome, 1971, 79, 2274.

Nicholas II., of Russia, 1971, 1505, 2471.

Nicholas II., of Russia, 1971, 151, 2471.

Nicholas II., of Russia, 1971, 151, 2471.

Nicholas, Saint, 1971, 2525.

Nicias, 1972; Pericles, 2159.

Nickel, 1972, 547, 1766.

Nicobar Islands, 1972.

Nicodemus, 2391.

Nicolini, Adelina Patti, 2124. Nicolini, Adelina Patti, 2124. Nicollet, Jean, 3169. Nicollet, Jean, 3169.
Nicomachus (Germasemus), 141.
Nicotine, 1972, 2246.
Niebuhr, Barthold Georg, 1972, 1130, 2085.
Niebuhr, Karster, 725, 1972.
Niehaus, Charles Henry, 1972, 2570.
Niello, 1973; enamel, 914.
Niemen, or Memel, River, 1973, 220.
Niepce, Niéphore, 740.
Niflheim, 1973, 1279.
Niger, or Joliba, River, 1973, 2425.
Nigeria, or Niger Territories, 1973, 1189. Niger, or Joliba, River, 1973, 2425. Nigeria, or Niger Territories, 1973, 1189. Nigger-toes, 364. Night, 540, 931, 1824, 1921. Night Hawk, 1973, 298. Night Heron, 1974, 2195; thrush, 2872. Nightingale, 1974, 2195; thrush, 2872. Nightingale, Florence, 1974, 2124, 2570. Nightmare, or Incubus, 1975, 1733. Nightshade, 1975, 270, 3070. Nihilist, 1975, 3032. Niihau, Island, 1265. Niigata, Japan, 1975. Niigata, Japan, 1975. Nijni Novgorod, or Nizhni-Novgorod, Russia, 1975. Nikko, 1975. Nile, Battle of the, 1977, 8, 1920. Nile River, 1976, 881, 2425; delta, 778. Niles, Ohio, 1977. Niles, Onio, 1977.
Nilsson, Christine, 1977.
Nimbus, 1977, 606, 607.
Nimeguen, Netherlands, 1977.
Nimeguen, Treaty of, 3152.
Nimes, or Nismes, France, 1977, 124.
Nimrod, 1978, 873.
Nimrod, Palace of, 132.
Nimrod, or Nimroud, 1978. Nimrud, or Nimroud, 1978. Nineveh, Asia, 1978, 171, 2588. Ningpo, China, 1978. Ninus, of Assyria, 1978, 2584. Niobe, 1978, 2144. Niobium, 547. Nipigon, or Nepigon, Lake, 1979, 2038. Nipissing Lake, 1979, 2038.
Nipissing Lake, 1979, 2038.
Nipmunks, 1979, 1730.
Nippon, or Niphon. See Japan, 1437.
Nippur, Babylonia, 1979.
Nirvana. See Bupphism, 396. Nisan (month), 1979. Nish, or Nissa, Servia, 1979. Niter. See Saltpeter, 2509. Nitrate, 1979, 2509. Nitric Acid. 1979, 15.

Nitrobenzol, or Nitrobenzine, 1980, 277. Nitrogen, 1980, 42, 547. Nitroglycerin, 1980, 849, 959. Nix, or Nixie, 1980. Nixon, Lewis, 1980. Nixon, Lewis, 1980. Nizhni-Novgorod. See Nijni Novgorod, 1975. Noah, 1981, 127, 779. Nobel, Alfred Bernard, 1981, 849, 1778. Nobel, Alfred Bernard, 1981, 849, 177 Nobility, 1981, 2987; peer, 2140. Noble, Alfred, 1982. Node, 1982, 174, 865. Nogi, Ki-teu, 1982, 2473. No Man's Land, 2028. Nom de Plume, 222, 2326. Nome, 1982, 471; Cape, 50. Nonconformists, or Dissenters, 1982. Nones, 1982; idea, 1363. Nones, 1982; ides, 1363. Noor Mahal, 2809. Nordau, Max Simon, 1982. Nordenskjöld, Nils Adolf Erik, Baron, 1983, 2249. Nordhoff, Charles, 1983. Nordica, Lillian, 1983. Nordkyn, Cape, 1989. Norfolk, Va., 1983, 1245, 1436. Norfolk Island, 1984. Norfolk Island Pine, 1984. Normal School, 1984, 873, 2555. Norman School, 1984, 813, 2555.

Norman Conquest, 921, 1263, 1996.

Normandy, 1984, 921, 1995, 3151.

Norman French, 1984.

Normans, 1984, 1995.

Norns, 1984; Fates, 980.

Norris, Frank, 1985.

Norristown, Page 1985, 9151 Norns, 1984; Fates, 980.
Norris, Frank, 1985, 2151.
Norristown, Pa., 1985, 2151.
Norsemen, or Northmen, 1994, 1565, 2563.
North, Christopher, 2327, 3157.
North, Frederick, Lord. 1985, 409.
North, John Thomas, 1985.
North Adams, Mass., 1985.
North Adams, Mass., 1985.
North America, 1985, 49, 82, 427, 451, 495, 520, 530, 683, 788, 1066, 1285, 1468, 1545, 1578, 1713, 1756, 1772, 2268, 2962, 3038.
Northampton, England, 1989.
Northampton, Mass., 1989.
North Attleboro, Mass., 1989.
North Braddock, Pa., 1989.
North Cape, 1989, 946.
North Carolina, 1989, 2978.
North Carolina, University of, 1992, 1991.
Northcote, Sir Stafford. See Iddesleigh, 1363.
North Channel, 1405, 2561.
North Dakota, University of, 1994.
Northeast Passage, 2077, 2249.
Norther, or Cold Wave, 1994; northwester, 1996.
Northern Lights, 186.
Northern Pacific Tunnel, 2936.
Northfield Summer School, 1842.
North German States, 1131, 3152.
Northmen, or Norsemen, 1994, 1565, 1999, 2628. North German States, 1131, 3152. Northmen, or Norsemen, 1994, 1565, 1999, 2628, 2978; vikings, 1994. North Platte River, 1912, 2236, 3192. North Polar Exploration. See Polar Expedi TIONS, 2248. North Pole, 8, 135, 664, 1675, 2134, 2252, 3224. Northrop, Cyrus, 1995. North Sea, or German Ocean, 1995, 1125. North Sea Canal, or Holland and Amsterdam Canal, 1995. North Star. See Polestar, 2253.

North Tonawanda, N. Y., 1995, 2894. Northumberland, 1996, 2067, 2157. Northumberland, Duke of, 1720. Northumbria, 102, 870, 1289. Northwester, 1996; norther, 1994. Northwestern University, 1996, 952, 1367. Northwest Passage, 1983, 2077, 2249. Northwest Territories, 1996, 458. Northwest Territory, 1996, 2024, 2351. Norton, Mrs. Caroline, 3251. Norton, Charles Eliot. 1996. Norton, Mrs. Caroline, 5251.
Norton, Charles Eliot, 1996.
Norwalk, Conn., 1997.
Norwalk, Ohio, 1997.
Norway, 1997, 950; Calmar Compact, 783, 786;
Lapland, 1543; language, 1999; literature, 1999;
Thirty Years' War, 2864; University, 1998, 2997.
Norway Spruce, 1001, 2717.
Norwich, Conn., 1999, 656.
Norwich, England, 2000, 918.
Norwich, N. Y., 1999.
Norwood, Mass., 2000.
Norwood, Ohio, 2000.
Nose, 2000, 2588; bones of, 2646.
Nosology, 1749.
Notary, or Notary Public, 2000, 35, 771.
Notation and Numeration, 2001, 141. Notary, of Notary Public, 2000, 35, 711 Notation and Numeration, 2001, 141. Notre Dame, Cathedral of, 2001, 199. Notre Dame, University of, 2001, 2687. Nottingham, England, 2001, 918. Noun, 2001, 2117. Nova Scotia, 2001, 468, 1934. Nova Zembla, Island, 2003, 164, 2249. Novello, Joseph Alfred, 2003, 104, 2249.
Novello, Joseph Alfred, 2003.
Novels, 2003; literature, 1602.
November, 2004, 1839.
Novgorod, or Novgorod-Veliki, Russia, 2004, 2471. 2471.
Novikov, Nikolay Ivanovich, 2470.
Novum Organum, 2004, 2196.
Noyes, John Humphrey, 2157.
N-Rays, 2004.
Nubar Pasha, 2004.
Nubia, 2004, 10, 940.
Nucleus (in animals), 91.
Nucleus (in astronomy), 639.
Nuisance, 2005, 2899.
Nullification, 2005, 436, 1429.
Numania, 2560. Nullification, 2005, 436, 1429.
Numantia, 2560.
Numa Pompilius, 2005, 874, 2442, 3039.
Number, 2005, 141, 2000.
Numbering Machine, 2005.
Numbers, Book of, 2005, 289, 2154.
Numidia, 2005, 68.
Numidian Marble, 1704.
Numidians, 1248, 2006.
Numismatics, 2006; coinage, 620.
Nummulite, 2006; foraminifera, 1029.
Nun, 2006; Ursulines, 3002; Loreto, 1628.
Nuncio, 2006; minister, 1797.
Nuñez, Blasco, 2229.
Núñez de Arce, Gaspar, 2006. Nuñez, Blasco, 2229.
Núñez de Arce, Gaspar, 2006.
Nur-ed-Din Mahmud, 2007.
Nuremberg, or Nurnberg, Germany, 2007, 3075.
Nurse, 2007, 239, 1974.
Nursery, 2007; horticulture, 1325.
Nut, 2007; oils of nuts, 2025.
Nutation, 2008.
Nuteracker, 2008. Nutcracker, 2008. Nuthatch, 2008. Nutmeg, 2008, 1660, 2025, 2707; melon, 1753. Nutmeg State, 655.

211

Nutrition, 2009, 1027. Nutt, Commodore, 847. Nux Vomica, 2009, 2742. Nyassa, Lake, 2009, 1123, 2288. Nyassaland, 2009, 375. Nye, Edgar Wilson, 2009, 89, 2327. Nylghau, or Nilgai, 2009; antelope, 110. Nymphs, 2010, 834, 1888.

O

O, 2011, 2198, 2951; cipher, 584.
Oahu, Island, 2011, 1265.
Oajaca. See Oaxaca, 2013.
Oak, 2011, 1021, 2815; charter, 1260.
Oak Galls, or Oak Apples, 2012, 1089.
Oakland, Cal., 2012, 440; Oak Park, 2012.
Oakum, 2012, 441.
Oamaru, New Zealand, 1966.
Oar, 2012, 320, 1088.
Oarfish, 2012; ribbon fish, 2410.
Oasis, 2012, 90, 1763, 2436, 2487.
Oates, Titus, 1447.
Oates, William Calvin, 2012.
Oats, 2013, 1176; oatmeal, 2009.
Oaxaca, or Oajaca, Mexico, 2013, 1775.
O'Bail, John, 680.
Obadiah, 2013, 289, 2320.
Obeidallah, 441, 980. Obeidallah, 441, 980.
Obeidallah, 441, 980.
Obelisk, 2013, 1280, 2101, 2857.
Oberammergau, Germany, 2014, 1805.
Oberlin, Ohio, 2014.
Oberlin, Johann Friedrick, 2014 Oberiin, Onio, 2014.
Oberlin, Johann Friedrich, 2014.
Oberlin College, 2014, 2024.
Oberon, 2014, 1654.
Oberon (satellite), 2535, 3000.
Obi, or Ob, River, 2014, 164, 2425; Ob Gulf, 162.
Object Glass, 1782, 2838.
Object Method, 2380.
Oboe, or Hauthoy, 2015 Oboe, or Hautboy, 2015. Obongo, 2338. Obringo, 2555. O'Brien, Cornelius, 2015. O'Brien, William, 2015. Observatory, 2015; Berlin, 2015; Greenwich, 1201; Lick, 1585; telescope, 2838; Yerkes, 556, 3206. Obsidian, 2016. Obstetrics, or Midwifery, 1748. Obstdrain, 2010.
Obstdrain, 2016.
Ocarina, 2016.
Ocean. See Sea, 2571.
Ocean Grove, N. J., 2016, 160.
Oceanica, or Oceania, 2016, 2264.
Oceanus, 2765, 2883, 3000.
Ocelot, 2016; tiger cat, 2878.
Ochiltree, Thomas P., 2016.
Ochino, Bernardino, 477.
Ochre, or Ocher, 2016, 2081, 2212.
Ocklawaha River, 2016.
Ocmulgee River, 2017, 1120.
Oconee River, 2017, 1120.
O'Connell, Daniel, 2017, 2193.
O'Connor, Thomas Power, 2017.
O'Conor, Charles, 2017.
Ocotlan, Mexico, 532.
Ocracoke Inlet, 2017, 2090.
Octavia, 2018, 599.

Octavianus. See Augustus, 184. Octavius, Cneius, 584, Octavo, 2018, 335; octave, 1880. October, 2018, 1839. Octopus, 2018, 732, 1822. Odd Fellows, Independent Order of, 2018. 274. Ode, 2018.
Odense, Denmark, 2019, 782.
Oder River, 2019, 1125.
Odessa, Russia, 2019; University of, 2019.
Odin, 2019, 2364, 2868, 3173.
Odoacer, 2019, 1170, 1893, 2444.
Odojevski, Prince, 2470.
Odysseus, 1194, 2957.
Odyssey. See Homer, 1315.
Oedipus, 2020, 113, 2706.
Oehlenschläger, Adam Gottlob, 2020, 783, 826.
Oelwein, Iowa, 2020.
Oersted, Hans Christian, 892.
Oeta Mountains, 2020.
Offa, King of Mercia, 2488. Ode, 2018. Oersted, Hans Christian, 892.
Oeta Mountains, 2020.
Offa, King of Mercia, 2488.
Offenbach, Germany, 2020.
Offenbach, Jacques, 2020, 2041.
Og, King, 2021, 91, 1141.
Ogden, Utah, 2021, 3006.
Ogden College, 353, 1502.
Ogdensburg, N. Y., 2021.
Oglesby, Richard James, 2021.
Oglethorpe, James Edward, 2021, 557, 1121.
Ogsowe, or Ogobay, River, 2021.
Ogygia, 2958.
Ohio, 2022, 1996, 2978.
Ohio and Erie Canal, 2560.
Ohio River, 2022, 71, 1829.
Ohio State University, 2024, 2997.
Ohm, 891, 594, 2024, 2962.
Ohm, Georg Simon, 2024, 891, 892.
Ohm's Law. See Ohm, Georg Simon, 2024.
Oil Cake (linseed), 1599.
Oil City Pa., 2025, 2177.
Oilcloth, 2025, 3103.
Oil of Tansy, 2815.
Oil of Vitriol, 2773.
Oils, 2025; anise, 106; bergamot, 278: coa Oil Palm. See Palm Oil, 2088.
Oils, 2025; anise, 106; bergamot, 278; coal, 1503, 2176; glycerin, 1154; lavender, 1551; lemon, 1568; linseed, 1599; nut, 2007; nutrition, emon, 1908; Intseed, 1939; nut, 2007; nutrition, 2009; olive, 2032; seneca, 2176; sperm, 3131; turpentine, 2946.
Oil Wells. See Petroleum, 2176.
Ojeda, Alonzo de, 627.
Ojibways, or Chippewas, 2025, 2534.
Oka River, 2026, 1975. Okapi, 2026. Okeechobee, Battle of, 2828. Okeechobee, Lake, 2026, 1016. Okhotsk, Sea of, 2026, 162.
Okhotsk, Sea of, 2026, 162.
Oklahoma, 2026, 1021, 1383, 2978.
Oklahoma, University of, 2029, 2028.
Oklahoma City, Okla., 2028.
Olaf, Saint, 2029. Olar, Saint, 2029. Olar, Saint, 2029. 2785. Olbers, Heinrich Wilhelm, 2029, 2086. Old Bay State, 1727. Oldcastle, Sir John, 2029. Oldenburg, Germany, 2029, 1128. Old Dominion State, 3054. Old Forge, Pa., 2029. Oldham, England, 2030, 918. Old Ironsides, 661, 1335. Old Line State, 1721. Old North State, 1989.

Old Point Comfort, Va., 2030, 1037. Old Red Sandstone, 2030, 1951. Old South Church, 2030, 344. Old Testament, 287, 2320, 2919. Oldtown, Me., 2030. Olean, N. Y., 2030. Oleaner, 2031. Ole Bull. See Buil, Ole, 401. Oleic Acid, 2031. Olentz, Finland, 999, 1000. Oleic Acid, 2031.
Olentz, Finland, 999, 1000.
Oleomargarine, 2031, 24, 418.
Olfactory Nerve, 1923, 2000.
Olga, Princess, 1116.
Olga, Saint, 2031.
Olibanum, 1055.
Olifants River, 469.
Oligocene Period, 2031, 1115.
Oliobant Laurence, 2031. Oliphant, Laurence, 2031. Oliphant, Margaret, 2031. Olive, 2032, 2025, 3030.
Olive Oil. See Olive, 2032.
Oliver Optic, 20, 2327.
Oliver Typewriter, 2952.
Olives, Mount of, or Mount Olivet, 2032, 1454.
Olivetan, Pierre Robert, 442. Olla-Podrida, 2033. Ollivier, Emile, 2033. Olmstead, Frederick Law, 2033. Olmütz, Austria, 2033, 1845. Olney, Richard, 2033. Olympia, Greece, 2034. Olympia, Wash., 2033, 3095. Olympiad, 2034. Olympic Games, 2034, 991, 1194, 1790. Olympic Games, 2034, 991, 1194, 173 Olympus, Mount, 2034, 1192, 2057. Olyphant, Pa., 2035. Omaha, Neb., 2035, 1914, 2975. Omahas, 2035, 742, 2268, 2642. O'Mahoney, John, 986. Oman, 2035, 125, 1875. Oman, Gulf of, 162, 2035. Omar I., 2036, 1818, 1819, 2084. Omar Khayyám, 2036, 2165. Omar Pasha, 2036. Omdurman, Battle of, 884. Omega, 76. Omega, 76. Omen, 2036, 805. Ommyiade Dynasty, 441, 2697. Omnes, of Ninevah, 2584. Omnibus. See Carriage, 490. Omnibus Bill, 2036, 597. Omnibus Bill, 2036, 597.
Omri, 41.
Omsk, Russia, 2036, 2626.
Onega, Lake, 2036, 2467.
Onega Bay, 2036, 3142.
Onega River, 2036, 2467.
Oneida, N. Y., 2036.
Oneida, Lake, 2037, 1956.
Oneonta, N. Y., 2037.
Onion, 2037, 1098, 1561.
Onkelos, 2037.
Onomacritus, 2037.
Onomacritus, 2037.
Onondaga, 2037.
Ontario, 2037, 455, 1645.
Ontario, Lake, 2040, 1533.
Onyx, 2040, 35, 2750.
Onyx Marble, 2040; marble, 1704.
Oölite, 2040, 1115, 1593.
Oori Limpopo, or Crocodile, River, 2040, 31, 2911.
Oost, Jakob van, 387. Oost, Jakob van, 387.

Opah, or Kingfish, 2040.
Opal, 2041, 2750.
Opelika, Ala., 47.
Opera, 2041, 825, 2855.
Opéra Bouffe, 2041; comedy, 638.
Opera Glass, 2031, 1569.
Ophicleide, 2042.
Ophicleide, 2042.
Ophic, 2042.
Ophic, 2042.
Opie, John, 2042, 353.
Opitz, Martin, 1129, 2245.
Opium, 2042, 1548, 2275.
Opium Eater, 785.
Opium Smoking, 565, 2042.
Opium War, 568, 2043.
Oporto, Portugal, 2043, 2287.
Oporto Wine, 3162.
Opossum, 2043, 757, 1717.
Oppeln, Germany, 2043.
Opper, Frederick Burr, 2043, 482.
Oppert, Jules, 2044.
Optic, 2044. Oppert, Jules, 2044. Optics, 2044, 1588, 1805, 2315. Optimism, 2044, 2170. Oracle, 2044; Delphian, 778; Jupiter Ammon, 90, 2044; Sibylline, 2627.
Oran, Algeria, 2044. 68. Oran, Algeria, 2044, 68.
Orang, or Orang-Outang, 2044, 116.
Orange, 2045, 2025; osage orange, 2058.
Orange, Mass., 2045.
Orange, N. J., 2045, 1945.
Orange Day, 2046.
Orangemen, 2046; Boyne, 354.
Orange River, 31, 469, 2046.
Orange River Colony, 2046, 322, 2744, 2911.
Oration, 2047, 781, 3114.
Oratorio, 2047; chorus, 573.
Oratory, 580, 489; Philippics, 2187.
Orcagna, Andrea di Cione, 2047.
Orchard City, 410.
Orchardson, William Quiller, 2047.
Orchestra, 2048, 2856.
Orchids, 2048, 1530, 3020.
Ord. Edward Otho Cresap, 2048.
Ord. George, 3156.
Ordinance of 1787. See Northwest Territory, 1996. 1996. Ordinary, 2048. Ordovician, 2049. Ore, 2049, 1795; gold, 1160. Oreads, or Oreades, 2010. Oregon, 2049, 1021, 2978. Oregon, University of, 2051. Oregon City, 2051, 3150. Oregon City, 2051, 3150.
O'Reilly, Alexander, 3249.
O'Reilly, John Boyle, 2051.
Orel, Central Russia, 2052.
O'Rell, Max, 2052, 2327.
Orellana, San Francisco, 2052, 80, 888.
Orenburg, Russia, 2052, 3000.
Orestes, 2052, 1404.
Organ, 2052; cabinet, 1753, 2053.
Organ, American, 2053.
Oriana of England, 79.
Orien, Mount, 744.
Oriflamme, 2053.
Origen, or Origine, 2053, 3011. Origen, or Origine, 2053, 3011. Original Package, 2054. Origin of Species, 756, 955. Orinoco River, 2054, 499, 2683. Oriole, 2054, 221. Orion, 2054. Orion (astronomy), 2054, 661.

Oriskany, Battle of, 2054, 2495. Orizaba, Mexico, 2054. Orkney Islands, 2055, 2561. Orkney Islands, 2055, 2561.
Orleans, Battle of, 248, 1459.
Orleans, Duke of, 2055.
Orleans, France, 2055, 1459.
Orleans, House of, 1049.
Orleans, Louis Philippe Joseph, 2055.
Orleans, Maid of. See Joan of Arc, 1459.
Orloff, Aleksyey, Count, 2173.
Orloff Diamond, 749.
Ormond James Butter, Duke of 2056. Orloff, Diamond, 749.
Ormond, James Butler, Duke of, 2056.
Ormuz, or Hormuz, Island, 2056, 2165.
Ormuzd, or Ormadz, 2056, 3225.
Ornithology, 2056, 297, 3225.
Ornithorhynchus, or Duckbill, 2056, 837.
Orontes River, 2056, 2801.
Orpheus, 2057, 441.
Orris Root, 2057.
Orsini, 2057.
Orsini, Felice, 2057.
Orthography, 1129, 1176, 2704.
Orthopedics, 2057.
Orthoptera, 2057, 704, 1182.
Ortler, or Ortler Spitze, 2058, 193.
Ortolan, or Ortulan, 2058; bunting, 405.
Orton, James, 2058. Oruro, Bolivia, 2058. Oryx, 2058. Oryx, 2058.
Osage City, Kans., 2059.
Osage Orange, 2058, 1811.
Osage River, 2058.
Osages, 2059, 2268, 2642.
Osaka, or Ozaka, Japan, 2059, 1441.
Oscar I., Joseph Francis, 2059, 283, 2788.
Oscar II., Frederick, 2059, 2788.
Oscar II., Frederick, 2059, 2788.
Oscoola, 2059, 2584.
Osel, or Oesel, Island, 2059, 2421.
Osgood, Samuel, 2992.
Oshkosh, Wis., 2060, 3169.
Osier. See WILLOW, 3155.
Osiris, 2060, 928, 1416.
Oskaloosa, Iowa, 2060.
Osler, William, 2060.
Osman, or Othman, 2943, 2944. Osman, or Othman, 2943, 2944. Osman, Nubar Pasha, 2061, 2476. Osmanli Turks, 2943, 2944. Osmium, 2061, 547, 1766. Osmosis, 2061. Osmosis, 2061.
Osnabrück, Germany, 2061.
Osprey. See Fish Hawk, 1006.
Ossian, 2061; Fingal, 1668, 2061.
Ossification, 332, 495; skeleton, 2646.
Ossining, N. Y., 2061, 1958.
Ossoli, Marchioness. See Fuller, See FULLER, SARAH, 1077. Ossoli, Marquis, 1077. Ossoli, Marquis, 1077. Ostend, Belgium, 2061, 266, 2710. Ostend Manifesto, 2062, 721. Osteopathy, 2062, 1512, 1749. Ostracism, 2062. Ostrich, 2062, 298, 500, 913. Ostrogoths. See Goths, 1170. Oswald, Saint, 2063. Oswego, N. Y., 2063, 2727. Oswego Arrowroot, 154. Oswego Arrowroot, 134. Oswego Canal, 2040. Oswego River, 1956, 2063, 2586. Othman, or Osman I., 2063, 2943, 2944. Otho I., or Otto, 2063, 195, 1422. Otho II., 2064.

Otho IV., 1311.
Otho, Marcus Salvius, 2064, 2771.
Otis, Elwell Stephen, 2064.
Otis, Harrison Gray, 2064.
Otis, James, 2064, 2111, 3189.
Otis, J. H., 3256.
Oto Indians, 2065, 2268.
Otranto, Strait of, 2065, 24, 51, 1400.
Ottawa, Canada, 2065, 455.
Ottawa, Ill., 2065.
Ottawa, Kans., 2065.
Ottawa, River, 2066.
Ottawa, 2066, 2269.
Ottendorfer, Oswald, 2066.
Otter, 2066, 1079.
Otterbein, Philip William, 2962.
Otterburn, Battle of, 2067, 820. Otterbern, Battle of, 2067, 820.
Otter Tail River, 988, 1800, 2386.
Otto I., of Greece, 2067.
Ottoman Empire. See Turkey, 2940.
Ottoman Turks, 2943, 2944.
Ottuman Luya 2067, 1403 Ottoman Turks, 2943, 2944.
Ottumwa, Iowa, 2067, 1403.
Otway, Thomas, 826.
Ouachita, or Washita, River, 3098.
Oudaan, J., 1927.
Oudemans, A. C., 2575.
Oudenarde, Battles of, 945, 2067, 1711.
Oudenarde, or Oudenaarde, Belgium, 2067.
Oudh, or Oude, 2067, 1642.
Oudinot, Charles Nicolas, 2067.
Ouida, 2327, 2372.
Ounce, 2068; jaguar, 1432.
Ounce (weight), 2068, 119, 2298.
Ouro Preto, Brazil, 2068.
Ouse River, 2068, 2915.
Ouse, Great, River, 2068. Ouse River, 2068, 2915.
Ouse, Great, River, 2068.
Ouseley, Sir Frederick Arthur Gore, 2068.
Outram, Sir James, 2068.
Ouzel, or Ousel, 2068; dipper, 802.
Ouzel, Ring, 2422; Ovampo, 2068.
Ovary of Animals, 879; of plants, 1020.
Overbird, 2068.
Overbeck Johann Friedrich 2060 Overbeck, Johann Friedrich, 2069.
Overbeck, Johann Friedrich, 2069.
Overshot Wheel. See Wheel, 3134.
Over the Top, 2069.
Overtones, 1254.
Overture, or Introduction, 2041.
Overyssel, 1, 1924.
Ovid, Publius Ovidus Naso, 2069, 185, 2266.
Ovidarous Animals, 910; egg. 879. Ovid, Publius Ovidus Naso, 2069, 18 Oviparous Animals, 910; egg, 879. Ovoviviparous Animals, 2701. Ovules, 1020, 2579. Ovum, Fecundation of, 910. Owari, Bay of, 1888. Owatonna, Minn., 2069. Owego, N. Y., 2069. Owen, Sir Richard, 2069, 1359. Owen, Robert, 2070, 642, 666, 2668. Owen Meredith, 1653, 3249, 3256. Owens, John, 1690. Owen Meredith, 1653, 3249, 32 Owens, John, 1690. Owensboro, Ky., 2070, 1502. Owen Sound, Ontario, 2070. Owl, 2070, 298, 2301. Owl Moth, 1860. Owosso, Mich., 2071. Owyhee River, 2049, 2663. Ox, 2071, 397, 511. Oxalic Acid, 2071. Oxalis, 2071, 1021. Oxenstiern, or Oxenstierna, Oxenstiern, or Oxenstjerna, Axel, 2071, 2788. Ox-Eye Daisy, 577, 742. Oxford, England, 2072, 1583.

Oxford, Miss., 2071.
Oxford, Ohio, 2071.
Oxford, University of, 2072, 1548, 2997.
Oxides, 1554, 1766, 2073.
Oxlip Primrose, 2310.
Oxus, or Amu, River, 2073, 127, 2467.
Oxyartes, 62.
Oxygen, 2073, 42, 547, 1349, 2207.
Oyama, Iwao, Marquis, 2073, 2473.
Oyster, 2073, 221, 303, 1822, 2133, 2610.
Oyster Catcher, 2074; plover, 2238.
Ozaka, Japan, 2059.
Ozark Mountains, 2074, 1811.
Ozocerite, or Ozokerife, 2074.
Ozone, 2074, 180.

P

P, 2076, 2951. Paca, William, 2995. Paca, William, 2995.
Pachuca, Mexico, 2076, 1775.
Pachydermata (thick-skinned animals), 1687.
Pacific Ocean, 2076, 214, 2571.
Pacific Railroads, 2077, 700.
Pacific Slope, 2966.
Pacific Time, 2722.
Packard, Alpheus Spring, 2077.
Packer, Asa, 2077, 2687.
Pactolus River, 1783.
Paddlefish. 2078. Paddlefish, 2078. Paderewski, Ignace Jan, 2078, 1879. Padilla, Doña Maria, 2140. Padilla, Joha Maria, 2140. Padilla, Juan Lopez de, 2078. Padre, Island, 2851. Padua, Italy, 2078, 2997. Paducah, Ky., 2078, 1502. Páez, José Antonio, 2078. Paganini, Nicolò, 2079.
Page, David Perkins, 2079.
Page, Thomas Nelson, 2079.
Page, William, 2079. Page, William, 2079.
Paget, Sir James, Baronet, 2079.
Pagoda, 2079; temple, 2840.
Pago-Pago, Samoa, 2513.
Paine, John Knowles, 2080.
Paine, Robert Treat, 2080, 2995.
Paine, Thomas, 2080, 85, 934, 3237.
Painting, 2080, 1070, 1599; Holy Family, 1314; impressionist, 1371; landscape, 1538; mosaic, 1856; pigments, 2212; varnish, 3022.
Paintings, Twelve Great, 2081.
Paints, 2081, 2016, 3141.
Paisley, Scotland, 2081, 2563.
Pakenham, Sir Edward, 2082, 1950, 3085.
Palace of Earth's Repose, 2141.
Palacký, František, 2082. Palacký, František, 2082. Palacozoic Age, 35, 1115. Palais Royal, 2082, 2106, 2856. Palamedes, 2957. Palanquin, or Palankeen, 2082. Palastrina, Giovanni Piervanni, 1879. Palate, 2082, 2646, 2824, 3065. Palatinate, 2082, 2391, 2937. Palatine Hill. See Rome, 2440. Palawan, or Paragua, Island, 2082, 2187. Palazzo della Cancelleria, 2441. Palenque, Mexico, 2083. Paleography, 1701. Paleolithic Man, 2749.

Paleontology, 2083, 347; fossils, 1039.
Paleozoic Era, 2083, 1115.
Palermo, Italy, 2083, 2627.
Palermo, Gulf of, 2627.
Palestine, Tex., 2083, 2853.
Palestine, the Holy Land, or Canaan, 2083; Acre, 16; Canaan, 451; Crusades, 716; Galilee, 1086; Jerusalem, 1451; Jews, 1455; Jordan, 1470; Samaria, 2511; Zionists, 3222.
Palestrina, Giovanni Pierluigi da, 2084.
Paley, William, 940.
Palfrey, John Gorham, 2085.
Palgrave, Sir Francis, 2085.
Pali, 2085; Sanskrit, 2523.
Palimpsest, 2085; parchment, 2104. Palimpsest, 2085; parchment, 2104. Palimpsest, 2085, 1332. Palissy, Bernard, 2085, 2295. Palissy Pottery, 2085, 2295. Palladio, Andrea, 2085. Palladium, 2086. Palladium (metal), 2086, 547, 1766. Pallas. See MINERVA, 1795.
Pallas (astronomy), 2086, 2029.
Pallas, Peter Simon, 2086. Pallas-Athene, 1795. Palma, Spain, 2086, 1682. Palma, Thomas Estrada, 2086, 722. Palmas, Cape, 2086, 1581.
Palmer, Mass., 2086.
Palmer, Alice Freeman, 2086.
Palmer, Erastus Dow, 2086. Palmer, Erastus Dow, 2086.
Palmer, John McAuley, 2087, 394, 2260.
Palmer, Ray, 2087, 1353.
Palmerston, Australia, 188, 2278, 2686.
Palmerston, Henry John Temple, 2087.
Palmetto, 2087, 1017.
Palmetto State, 2687.
Palmistry, or Chiromancy, 2088.
Palm Oil, 2088, 461.
Palms, 2088, 1021; betel, 285; cabbage, 2088; cocoa, 615; date, 757; fan, 2089; ivory, 1425; palmetto, 2087; palmitic, 2025; sago, 2089, 2486; sugar, 2089.
Palm Sunday, 2089, 859. 2486; sugar, 2089.
Palm Sunday, 2089, 859.
Palmyra, Syria, 2089, 186, 3219.
Palo Alto, 2089, 2524, 2829.
Palo Alto, Cal., 2089.
Palos, Spain, 636.
Palpitation, 2080.
Paley or Paralysis, 2103. Palsy, or Paralysis, 2103.
Pamir Mountains, 2090; Tableland of, 2939.
Pamlico Sound, 2090, 471, 1990.
Pampas, 2090, 137; prairie, 2301.
Pampas Grass, 2090.
Pamphlet, 2090, 2906; pamphleteers, 2091. Pan, 2091. Pana, III., 2091. Pana, III., 2091.
Panama, Panama, 2091, 2092, 2093.
Panama, Bay of, 1575, 2091.
Panama, Isthmus of, 2093, 82, 1985.
Panama Canal, 2093, 459, 628, 1575.
Panama Congress, 2095.
Panama Hats, 2759.
Pan-American Congress, 2095, 308.
Pan-American Exposition, 398, 960.
Panay, Island, 2095, 2187.
Pancreas, 2095, 1398.
Pancreatin. 2096: digestion. 799. Pancreas, 2095, 1398.
Pancreatin, 2096; digestion, 799.
Panda, or Wah, 2096.
Pandora, 2096; Prometheus, 2319.
Pangolin, or Scaly Ant-eater, 869.
Pan Handle State, 3128.

Panic, 2096; of 1873, 1271; of 1837, 3016. Pannonia, 182, 1123. Panorama, 2097. Pansy, 1021, 3051. Pantheism, 2097, 1157. Pantheon, 2097; of Paris, 2097. Panther, 2097, 688, 2334. Pantner, 2097, 686, 2334. Pantokrator, 675. Pantomime, 2097. Páoli, Pascal de, 2097. Papacy, 2098, 2272. Papal Infallibility, 2228, 2273, 2438. Papal States, 2098, 1423. Papal Infallibility, 2228, 2273, 2438.
Papal States, 2098, 1423.
Papaw, 2098.
Paper, 2098; book, 335; newspaper, 1473, 1953, 2160; printing, 2313; rag trade, 2364; rice paper, 2412; wood pulp, 2099, 2364.
Paper Hangings, or Wall Paper, 2099.
Paper Nautilus, or Argonaut, 1907.
Paphos, or Papho, Cyprus, 2099.
Papias of Hierapolis, 119.
Papier-Maché, 2099, 420, 2741.
Papillae, 2099, 1233, 2824, 2903.
Papineau, Louis Joseph, 2100, 457, 2383.
Pappenheim, Gottfried Heinrich, 2100.
Papua. See New Guinea, 1940.
Papyrus, 2100, 1701.
Pará, or Belem, Brazil, 2100, 364.
Pará River, 2100, 2888.
Parable, 2101.
Parabola, 7, 639.
Paracelsus, 2101.
Parachute, 2101, 217.
Paradise, 2101, 461, 2177, 2392.
Paragua, or Palawan, Island, 2082.
Paraguay, 2102, 2684.
Paraguay River, 2101, 2102.
Parallax, 2103.
Parallelogram of Forces, 2103, 1030.
Parallels of Latitude, 1547. Parallelogram of Forces, 2103, 1030. Parallels of Latitude, 1547. Paralysis, or Palsy, 2103.
Paramaribo, Dutch Guiana, 2103, 1214.
Paraná River, 2104, 2683.
Paranahiba River, 2104. Parapet. See Fortification, 1035. Parasites, 2104, 1638, 2608, 2662, 2816, 2875. Parasitic, Diseases, 2104, 2423, 2918.

Parasitic Diseases, 2104, 2423, 2918.

Parcel Post, 2291, 3280.

Parchment, 2104, 2085.

Pardo-Bazán, Emilia, 2104.

Pardon, 2104, 2397.

Paré, Ambroise, 2105, 2781.

Parent and Child. See Infant, 1386.

Parhelion, 2105; halo, 1240.

Paria, Gulf of, 2105, 3027.

Parian Marble, 1704.

Parian Mountains, 362, 2054, 3027.

Paris, Count of (Duke of Orléans), 2055.

Paris, Declaration of, 2316.

Paris, France, 2105; academy, 11; Bastille, 244; catacombs, 503; Champ de Mars, 530; Commune, 642; expositions, 960; Jacobins, 1431; library, 1583; Louvre, 1639; Pantheon, 2097; Polytechnic School, 2265; Sorbonne, 2677; Tuileries, 2932; tower, 885; university, 2108, 2997.

Paris, Ill., 2105.

Paris, Matthew, 3079.

Paris, or Alexander, 2108, 15, 1280, 2925.

Paris, Synod of, 283. Parasitic Diseases, 2104, 2423, 2918. Paris, or Alexander, 2108, 15, 1280, 2925. Paris, Synod of, 283.

Paris, Treaties of, 2108, 2982. Paris, University of, 2108, 2997. Park, 2108, 522, 1841, 3204, 3209. Park, Edward Amasa, 2108; Mungo, 2108, 1973. Park City, Utah, 2109. Parke, John Grubb, 2109. Parker, Alton Brooks, 2109, 2261, 2447. Parker, Francis Wayland, 2109. Parker, Gilbert, 2109, 456. Parker, Horatio William, 2110. Parker, Horatio William, 2110.
Parker, Sir Hyde, 219.
Parker, Margaret, 3256.
Parker, Sir Peter, 1559.
Parker, Theodore, 2110, 381, 1300, 1606.
Parkersburg, W. Va., 2110, 3130.
Parkhurst, Charles H., 2110.
Parkman, Francis, 2110, 88, 1605.
Parks, National, 3191, 3204, 3209.
Parkerent, 2111 Parlement, 2111.
Parley, Peter, 1164.
Parliament, 2111; blue books, 318; Canada, 455; commons, 2111; dissolved by Cromwell, 710; long, 536, 710, 2339; lords, 2111; membership, 2111; short, 536.
Parliamentary Law, 2111.
Parma, Italy, 2112, 2208.
Parmenides, 2195.
Parnaces, 430, 3220.
Parnahiba River, 2112. Parlement, 2111. Parnahiba River, 2112. Parnassus Mountains, 2112, 778. Parnell, Charles Stewart, 2112, 1408. Parody, 2113. Paros, or Paro, Island, 2113, 734. Parotid Glands, 1148, 1869, 2505. Parr (salmon), 2506. Parr, Catherine, 1287, 2600. Parrakeet, or paroquet, 2113, 2114. Parrhasius, 2113. Parrot, 2113, 614, 1655. Parrot, 2113, 614, 1655.
Parrot, Robert Parker, 2114.
Parry, Charles Hubert Hastings, 2114.
Parry, Sir William Edward, 2114, 135, 237.
Parsees, 2114, 1445, 2164, 3225.
Parsley, 2115, 516, 2958.
Parsnip, 2115, 692, 2071.
Parsons, Kans., 2115, 1490.
Parsons, John E., 668.
Parsons, William Barclay, 2115.
Parsons' Case, or Cause, 2115, 1288.
Parthenogenetical Production, 2205.
Parthenon, 2116, 16, 202, 1360. Parthenon, 2116, 16, 202, 1360.
Parthenope, 1893.
Parthia, 2116; Parthians, 1229.
Parties, Political. See Political Parties, 2256.
Partnership, 2116; company, 643.
Parton, James, 2116.
Parton, Sara P., 2327.
Partridge, 2117, 2344.
Partridge, William Ordway, 2117.
Partridge Berry, 2117, 3165.
Parts of Speech, 2117, 22, 25, 2001, 2303, 2319, 3031; etymology, 943; philology, 2194.
Parysatis, 737. Parthenon, 2116, 16, 202, 1360. 3031; etymology, 943; philology, 21 Parysatis, 737. Pasadena, Cal., 2118, 440. Pascal, Blaise, 2118, 234, 3244, 3254. Pasha, or Bashaw, 2118. Paskevitch, Ivan Feodorovitch, 2118. Pasque Flower, 2333. Passaic, N. J., 2118, 1945. Passamaquoddy Bay, 2118, 2489. Passau, Treaty of, 1737, 2552. Passenger Pigeon. See Pigeon, 2212 Passenger Pigeon. See Pigeon, 2212.

Passion Flower, 2119, 2098. Passion Plays, 825, 1805, 2014. Passover, 2119; festivals, 991. Passover, Ended: 1001 Passport, 2119; minister, 1797.
Passy, Frederic, 1981.
Pasta, Giuditta Judith, 2119.
Pasteur, Louis, 2119, 296, 369, 1350, 1783.
Pastoral Poetry, 2120.
Patagonia, 2120; Patagonians, 1382.
Patapsco River, 2121, 1721.
Patchouli, 2121.
Patent, 2121, 2002. Patapsco River, 2121, 1721.
Patchouli, 2121.
Patent, 2121, 2992.
Paterins of Italy, 55.
Paterson, N. J., 2121, 1945, 2975.
Paterson, William, 2122.
Pathfinder of the Rocky Mountains, 1066.
Pathology, 1749.
Patmore, Coventry Kearsey, 2122.
Patmos, or Patmo, Island, 2122, 1461.
Patna, India, 2122, 1377.
Paton, John Gibson, 2123.
Paton, Sir Noel, 2123.
Patras, Greece, 2123, 1193.
Patriarch, 2123, 8, 1415, 1431.
Patricians, 2237, 2918.
Patrick, Saint, 2123, 1407, 2604.
Patrolus, 14, 2926.
Patrons of Husbandry, 977.
Patroons, 2123, 3021.
Patterson, C. P., 2124.
Patterson, Daniel Todd, 2124.
Patterson, Elizabeth, 331.
Patterson, I. B., 305. Patterson, C. F., 2124.
Patterson, Daniel Todd, 2124.
Patterson, Elizabeth, 331.
Patterson, J. B., 305.
Patterson, Malcolm Rice, 2124.
Patterson, William, 2989.
Patteson, John Coleridge, 2124.
Pattison, Maria Clorinda, Pattison, Mark, 2125.
Pattison, Mark, 2125.
Pattison, Robert Emory, 2125.
Patton, Francis Landey, 2125.
Paul, Jean, 2327, 2416.
Paul, Saint, 2125, 288, 984.
Paul, the Thebaid, 1293.
Paul II., 2125, 2273.
Paul III., 2126, 1452, 2916. Paul III., 2126, 1452, 2916. Paul IV., 2126, 2856. Paul V., 2126, 2414. Paul I., Petrovitch, 2126, 1520. Paulding, James Kirke, 2126.
Paulding, John, 99.
Paulists, or Paulist Fathers, 2126.
Paulician Chord. 2022. Paulicians of Greece, 55.
Pauline Chapel, 3023.
Paulis, Aemilius, 1248.
Paulo Affonso, Falls of, 2527.
Paulsen, Friedrich, 2127.
Paulus, Heinrich Eberhard, 1130.
Pauncefote, Sir Julian, 2127, 2171.
Pauperism. See Poor Laws, 2271.
Pausanias, 2127, 2233.
Pavement, 2127, 167, 370.
Pavia, Italy, 2128; Battle of, 1423.
Paving, 167; road, 2426.
Pawnbroker, 2128; broker, 380.
Pawnees, 2128, 2268.
Paw-Paw. See Papaw, 2098. Paw-Paw. See Papaw, 2098. Pawpaws, 1776. Pawtucket, R. I., 2128, 2409.

Paxton, Sir Joseph, 2129.
Payer, Julius von, 2129, 135, 2249.
Payne, John, 2129.
Payne, John Howard, 2129, 86, 826.
Payne, Sereno Elisha, 2129. Payne, Sereno Elisha, 2129.
Payson, Edward, 2129.
Pea, 2129, 463, 1027.
Peabody, Mass., 2130.
Peabody, Mass., 2130.
Peabody, George, 2130, 1239.
Peabody, Selim Hobart, 2130.
Peabody, Selim Hobart, 2130.
Peabody Educational Fund, 2130.
Peabody Institute, 220, 752, 2503.
Peace Conference. See Hague, The, 1231.
Peace of Paris, 1049, 2082, 2108.
Peace of Westphalia, 2082, 3128.
Peace River, 2131, 53, 175, 376.
Peach, 2131, 1075, 1779, 2326.
Peacock, or Peafowl, 2131.
Peacock Throne, 2601.
Peale, Charles Wilson, 2131.
Peale, Rembrandt, 2131.
Peanut, 2132; groundnut oil, 2025. Peale, Rembrandt, 2131.
Peanut, 2132; groundnut oil, 2025.
Pear, 2132; fruit, 1075.
Pea Ridge, Battle of, 2133, 809.
Pearl, 2133, 1883, 2610.
Pearl Mosque, 2001.
Pearl River, 2134, 1808.
Peary, Robert Edwin, 2134, 135, 2251.
Peasants' War, 2134, 93 Peary, Robert Edwin, 2134, 135, 2251.
Peasants' War, 2134, 93.
Peat, 2134, 1101, 323, 1076.
Pebble, 2135, 1183.
Pecan, 2135, 1298.
Peccary, 2135.
Pechili, Gulf of, 162, 563, 2141.
Peck, George W., 2714.
Peck, Harry Thurston, 2135.
Peck, James H., 1371.
Peckham, Rufus William, 2135.
Pecos River, 2135, 2851, 3041.
Pedagogy, 2135; correlation, 682; Froebel, 1072; kindergarten, 1507; methodology, 2137; normal school, 1984; Pestalozzi, 2171; psychology, 2327; schools, 2553.
Pedee, Great and Little, 1191, 1990.
Pedersen, Christian, 783.
Pedometer, or Odometer, 2139. Pedometer, or Odometer, 2139. Pedro I., 2139, 364, 1467. Pedro II., 2140, 34, 364. Pedro of Aragon, 2628. Pedro the Cruel, 2140. Pedro the Cruel, 2140.
Peduncle, or Stem, 1020, 1387.
Peekskill, N. Y., 2140.
Peel, Sir Robert, 2140, 1147, 2258.
Peele, George (1558-1597), 919.
Peer, 2140; nobility, 1981.
Pegasus, 2140; medusa, 1750.
Peggy O'Neill, 862.
Pegu, Kingdom of, 411.
Pei-Ho River, 2141, 2809.
Peipus, Lake, 2141.
Peirene. Fountain of, 117. Peirene, Fountain of, 117. Peixoto, Floriano, 2141, 1026. Pekah, of Israel, 41, 1456. Pekin, Ill., 2141. Peking, or Pekin, China, 2141, 567, 2877. Pelagic Deposits, 2572. Pelaginism, 2142. Pelagius, 2142. Pelargoniums, 1122. Pelasgians, 2142, 1195.

Pelée, Mont, 2142, 1719. Peleus, 14, 1884, 2862. Pelew Islands, 2142, 488. Peleus, 14, 1884, 2862.
Pelew Islands, 2142, 488.
Pelias, of Iolcos, 1443.
Pelias, of Iolcos, 1443.
Pelican, 2143, 1072, 2924.
Pélissier, Aimable Jean Jacques, 2143.
Pella, Macedonia, 2143, 62.
Pellico, Silvio, 1422.
Pelopidas, 2143, 926.
Peloponnesian War, 176, 676, 2144.
Peloponnesus, 2143, 676, 1195, 2159.
Pelops, 2144, 2815.
Pelotas, Brazil, 2144, 364.
Pelvis of the Kidney, 1506.
Pelvis, 2144; bones of the, 2646.
Pemba, Island, 2144, 378, 3216.
Pemberton, John Clifford, 2144, 292, 590.
Pembroke, Ontario, 2144.
Pemmican, 2144; bison, 302.
Pen, 2144, 3188; fountain pen, 2145.
Penance, 2145; justification, 1481.
Penang, or Prince of Wales Island, 2145.
Penang, or Prince of Wales Island, 2145.
Pendleton, George Hunt, 2146.
Pendleton, George Hunt, 2146.
Pendlum, 2146, 605, 935.
Penelope, 2147, 2957.
Penguin, 2147, 672.
Penikese, Island of, 34, 904.
Peninsular Campaign, 2147, 1657.
Peninsular Campaign, 2147, 1657.
Peninsular Campaign, 2147, 1657. Peninsular Campaign, 2147, 1657. Peninsular War, 2148, 1843, 1895. Penitentiary. See Prisons, 2315.
Penmanship, 2144, 3188.
Penn, John, 2995.
Penn, William, 2148, 1945, 2152, 3242, 3251.
Pennacooks, 1730. Pennacooks, 1730.
Pennell, Joseph, 2149.
Pennon, 1009.
Pennsylvania, 2149, 2978.
Pennsylvania, University of, 2152, 2151.
Pennsylvania Dutch, 2152.
Penny, 2152; pence, 2298.
Pennymite Wars, 3193.
Pennymacker, Galusha, 2152. Pennymac Wars, 5153.
Pennypacker, Galusha, 2152.
Penobscot Bay, 2152, 1678.
Penobscot River, 2152, 225, 1679.
Pensacola, Fla., 2153, 1018.
Pension, 2153, 2992.
Pentateuch, 2154, 180, 288.
Pentecost, 2154, 119.
Penumbra, 2154, 865, 866.
Peonage, 2154; peon, 2154.
Peony, 2154.
People's Party, 2154, 2260, 3111.
Peoria, III., 2155, 1366.
Pépin le Bref, 2155, 483, 535.
Pepper, 2155, 2707.
Pepper, William, 2155.
Peppermint, 1803, 2025.
Peppermint, 1803, 2025.
Pepsin, 2156, 1102, 2748.
Peptone, 2156, 1102, 2748.
Peptone, 2156, 1102, 2748.
Pepys, Samuel, 2156.
Pequots, or Pequods, 2156, 656, 18 Pennypacker, Galusha, 2152. Pequots, or Pequods, 2156, 656, 1820. Pequot War, 2156. Perception, 2156, 120, 645, 2328. Perch, 2156, 243, 2213. Perchers (insessores), 298. Percival, James Gates, 2157. Percussion, 2157; auscultation, 197 Percussion, 2157; auscultation, 187. Percy, 2157, 551. Percy, Harry, 2067.

Percy, William de, 2157. Père Hyacinthe, 1641. Pereira, Jacob R., 765. Perennials, 2233, 2448. Perez Galdós, Benito, 2157. Perfectionism, 2157. Perfectionism, 2157.
Perfectionists, or Free Lovers, 2157.
Perfumery, 2158; attar, 181.
Perfumes, 2158, 81, 1881, 2450.
Pergamus, or Pergamun, Asia Minor, 2159.
Peri, 2159; angel, 101.
Periander, 676, 2595.
Perianth, 443.
Pericardium, 2159, 1274, 2590.
Pericarp, in botany, 1075.
Pericles, 2159, 779, 1194.
Perigee, 118. Perigee, 118.
Perihelion, 118, 639, 856.
Perim, Island, 2160, 202.
Periodical, 2160, 1473, 1953.
Perioikoi, 2700. Periokoi, 2700.
Periokoi, 2700.
Peripatetic Philosophy, 2160, 141.
Peripatetic School, 2234; idealism, 1363.
Peristaltic Action, 799, 1398, 2748.
Peritoneum, 5, 1763, 2568, 2590, 2712.
Periwinkle, 1885.
Perizzites, 2084.
Perjury, 2160, 2215.
Perkins, Eli, 1538.
Permian System 480, 1115 Permian System, 480, 1115. Pernambuco, or Recife, Brazil, 2160, 364. Perpetual Motion, 2161. Perpignan, France, 2161. Perrault, Charles, 2161. Perrine, C. D., 1479; Perry, Okl., 2161. Perry, Arthur Latham, 2161. Perry, Matthew Calbraith, 2162. Perry, Oliver Hazard, 2162, 933, 2980. Perryville, Battle of, 2162, 356. Persepolis, Persia, 2162. Perseus, 2162, 1167, 1277, 1750. Pershing, John Joseph, 2163. Persia, 2163; Armenia, 147; architecture, 132; Persia, 2163; Armenia, 147; architecture, 132; Artaxerxes, 155; carpet making, 490; cuneiform writings, 725; Iranians, 1404; language, 2164; Media, 1747; national emblem, 1020; Parsees, 2114; Urumiah, 3004.
Persian Gulf, 2165, 2163.
Persians, 1404, 1790, 2164.
Persigny, Jean Gilbert, 2166.
Persimmon, 2166, 757.
Persius, Flaccus Aulus, 2166.
Personal Property, 2166, 542, 938.
Personification, 997.
Perspective, 2166.
Perspiration, 2648, 2785. Perspiration, 2648, 2785. Perth, Scotland, 2167, 2563. Perth, Western Australia, 2167, 3125. Perth Amboy, N. J., 2167, 1945. Perturbation, 2167. Perturbation, 2167.
Peru, Ill., 2167.
Peru, Ind., 2167.
Peru, 2168, 2228; aqueducts, 123; Incas, 174; minerals, 2168; universities, 733, 2169.
Perugia, Italy, 2170.
Perugino, Pietro Vannucci, 2170, 2375.
Peruvian Bark, 2170, 582, 2356.
Peruvians, 1382.
Perseta (money), 1826, 2605. Peseta (money), 1826, 2695. Peshawar, or Peshaur, India, 2170. Peso, 2170, 138. Pessimism, 2170, 2556.

Pestalozzi, Johann Heinrich, 2171, 875, 2554. Pesth. See Budapest, 395. Pestilence, Glandular, 2229. Pestilence, Glandular, 2229.
Pétain, Henri Philippe, 2172.
Petals, 1020; calyx, 443; Petard, 2172.
Petchora River, 2172, 948, 2467, 3000.
Peter, Saint, or Simon Peter, 2172, 119, 2438.
Peter, Epistles of, 289.
Peter I., of Russia, 2172, 507, 1857, 2471, 2499.
Peter II., Alexeievitch, of Russia, 2173, 2471.
Peter III., Feodorovitch, of Russia, 2173, 507.
Peter, or Pietro I., of Montenegro, 1836.
Peter I., of Servia, 2173, 2593.
Peterborough, England, 2173.
Peterborough, Ontario, 2173.
Peter the Cruel. See Pedro The Cruel. 2140. Peterborough, Ontario, 2173.
Peter the Cruel. See Pedro The Cruel, 2140.
Peter the Hermit, 2174, 90, 716.
Peters, Christian Henry Frederick, 2174.
Peters, Christian Henry Frederick, 2174.
Peters, Saint, 2174, 2441.
Petersburg, Va., 2174, 1180.
Petersburg, Siege of, 2175, 1561.
Peterson, Frederick, 2175.
Peterson, William, 2175.
Peter's Pence, or Romescot, 2175.
Petiole, or Leaf Stalk, 1555.
Petion de Villeneuve, Jérome, 2437.
Petitodiac River, 340, 1825, 1934.
Petition, 2175. Petition, 2175. Petition of Rights, 2175, 902. Petition of Rights, 2175, 902.

Petit Jury, 1480.

Petoskey, Mich., 2175.

Petrarch, Francesco, 2176, 199, 919, 1422.

Petrel, 2176, 1077, 2147, 2607: Petri, Olaus, 2787.

Petrified Wood, 1795.

Petrograph Paris 2409. Petrograd, Russia, 2498. Petroleum, 2176, 1892, 2025; lamp, 1010. Pettie, John, 2177. Pettigrew, Richard Franklin, 2177. Pettus, Edmund Winston, 2177. Petty Larceny, 1544. Petunia, 2178. Pewter, 2178, 1542, 1554. Pezza, Michele, 1044. Pforzheim, Germany, 2178. Phaedo, or Phaedon, 2178. Phaedo of Plato, 2235, 2670. Phaedra (mythology), 2178, 2862. Phaedrus, 2178. Phaethon, or Phaeton, 2178. Phaeton, 2179, 491. Phalanges, 1028, 1246, 2646. Phalanx, 2179, 150. Phalereus, Demetrius, 64. Phanerogamous Plants, or Phanerogams, 2179. rnaraoh, 2179, 884, 1472. Pharisees, 2179, 1456, 2482. Pharmacopoeia, 2179. Pharmacist, 119, 2180. Pharmacy, 2180, 119, 1749. Pharnaces, 430. Pharaoh, 2179, 884, 1472. Pharos, Island, 2180, 63.
Pharos Lighthouse, 63, 1589, 2595.
Pharsalia, Battle of, 430, 510, 2268, 2443.
Pharynx, 2180, 254, 2000, 3059.
Pheasant, 2180, 2131. Phelps, Austin, 2181. Phelps, Elizabeth Stuart, 2181, 89. Phelps, William Walter, 2181. Phi Beta Kappa, 2181, 1057.

Phidias, 2181, 2116, 2569, 2595. Philadelphia, Pa., 2181, 960, 2974. Philadelphus, 64. Philaeiphus, 64.
Philae, Island, 2184, 1976.
Philander Smith College, 1608.
Philemon, Epistle to, 289.
Philip, 2184, 119.
Philip, the Evangelist, 2184.
Philip, King, 2184, 1731.
Philip, II., of Macedon, 2184, 781, 1195, 1660, 2870. Philip III., of Macedon, 2184.
Philip IV., of Macedon, 2184.
Philip V., of Macedon, 2184.
Philip I., of France, 2185, 1287.
Philip II., Augustus, of France, 2185, 717, Philip III., of France, 2185, 3014.
Philip IV., of France, 2185, 2840.
Philip V., of France, 2185.
Philip VI., of France, 2185, 877, 1049.
Philip I., of Castile and Aragon, 2186.
Philip II., of Spain, 2186, 1136, 1721, 2288, 2697.
Philip III., of Spain, 2186, 1161, 2697.
Philip IV., of Spain, 2186, 2698, 3026.
Philip V., of Spain, 2186, 350, 2698.
Philip V., of Spain, 2187, 408.
Philip the Bold, 2187, 408.
Philip the Good, 2187, 408.
Philippians, Epistle to, 289.
Philippians, Epistle to, 289.
Philippians, 2187, 781, 2185.
Philippines, 2187, 1648, 1918, 2963, 2982.
Philippopolis, Bulgaria, 2192, 401.
Philistines, 2192, 759, 1456, 2084.
Phillips, Wendell, 2193, 7, 88, 3250, 3252.
Phillipsburg, N. J., 2193, 1945.
Philotetes, 2193, 2108.
Philo Judaeus, 2193, 1458, 2860.
Philology, 2194, 937, 1540, 2549, 3060.
Philopoemen, 2195.
Philopoemen, 2195. Philopoemen, 2195.
Philosopher's Stone, 57.
Philosophy, 2195, 140, 186, 409, 780, 797, 801, 881, 911, 926, 1155, 1290, 1336, 1492, 1614, 1630, 1734, 2097, 2548, 2556, 2669, 2704, 2748, 2854, 3007. Phipps, Lord Mulgrave, 135. Phlox, 2196. Phocion, 2196. Phoebe, or Pewee, 2196.
Phoebus, 2196.
Phoenicia, 2196; Carthage, 493; colonization, 628; Sidon, 2629; Tyre, 2953; writing, 3188.
Phoenicians, 628, 640, 1910, 2197. Phoenicians, 628, 640, 1910, 2000, Phoenix, 2198.
Phoenix, Ariz., 2198, 143, 745.
Phoenix, Islands, 2264.
Phoenix Park, 835.
Phoenixville, Pa., 2198.
Phonetic Method, 2380.
Phonetics or Phonology, 219 Phonetics, or Phonology, 2198; voice, 3059. Phonograph, 2199, 871, 1177. Phonography. See Shorthand, 2620. Phosphate, 2199, 2200, 2292. Phosphides, 2200, 2292. Phosphides, 2200, 2292. Phosphides, 2200, 2292, Phosphorescence, 2200, Phosphoric Acid, 2200, Phosphorus, 2200, 547, 1081, 1734, Photius, 2200; patriarch, 2123, Photo-Engraving, 2201, 924, Photography, 2201, 633, 740; color, 2201, Photogravure, 2202, 924.

Photo-Lithography, 1607, 2202.
Photometry, 2203; photometer, 2203.
Photophone, 2203, 269.
Photosphere, 2776.
Phototelegraphy, 2203, 2201.
Phrenology, 2204, 1088.
Phrygia, 2204, 166, 779, 1783.
Phylloxera, 2204, 803.
Physical Culture, 176, 441, 778, 872, 1224.
Physical Geography. See Geography, 1112.
Physical Training, 778, 1224.
Physical Training, 778, 1224.
Physick, Philip Syng, 2205.
Physics, or Physical Science, 2205, 22, 620, 849, 886, 952, 959, 973, 1030, 1064, 1071, 1100, 1183, 1184, 1349, 1350, 1389, 1503, 1587, 1727, 1735, 1746, 1823, 2103, 2146, 2252, 2332, 2334, 2679. 2679. 2679.
Physiognomy, 2205, 1764.
Physiography, 2206; earth, 854.
Physiologists, 3025.
Physiology, 2206, 120, 169, 255, 314, 489, 517, 2400, 2505, 2578, 2748, 3059.
Physiology, vegetable, 2206.
Phytotomy, 95.
Piacenza, Italy, 2208.
Pia Mater, 358, 2709.
Pianoforte, or Piano, 2208; music, 1879.
Pianola, 2209.
Piastre, or Piaster, 2209, 1826. Pianola, 2209.
Pianola, 2209.
Piastre, or Piaster, 2209, 1826.
Piatt, John James, 2209.
Piazza del Campidoglio, 476.
Piazzi, Guiseppe, 172, 523.
Pibroch, 2209; bagpipe, 210.
Picayune, 2209; picayunish, 2209.
Piccolomini, Ottavio, 2209.
Pichegru, Charles, 2771.
Pichincha, Mount, 2357.
Pickens, Andrew, 2209.
Pickens, Francis Wilkinson, 2210.
Pickerel. See Pike, 2213.
Pickering, Edward Charles, 2210.
Pickering, John, 1371.
Pickering, Timothy, 2992.
Pickett, George Edward, 2210, 1008, 1245.
Pickles, 2210, 723, 1290.
Pickwick Papers, 795. Pickes, 2210, 123, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300, 12300 Pictured Rocks, 2780. Picture Galleries. See ART GALLERIES in Index. dex.
Pidgin, Charles Felton, 2210.
Piedmont, 2211, 2938.
Piedmont Plain, 2211, 2425, 2965.
Pie Plant (rhubarb), 2410.
Pierce, Franklin, 2211, 2566, 2976.
Pierce, F. W., 292.
Pieria, 1878; Thrace, 2870.
Pierola Nicolas de, 2211. Pierola, Nicolas de, 2211. Pierre, S. D., 2211, 2691. Pierrepont, Edwards, 2212. Pierrepont, Edwards, 2212.
Pietermaritzburg, Natal, 2212, 1901.
Pig. See SWINE, 2792.
Pigeon, 2212, 491, 821, 2946.
Pig Iron, 311, 1410.
Pigments, 2212, 2081, 2825.
Pigweed, or Goosefoot, 2213, 2356.
Pika, 2213; Rocky Mountain pika, 2213.
Pike, 2213; bony pike, 334; saury pike, 2537.
Pike, Albert, 2213.
Pike, Zebulon Montgomery, 2213, 632.

Pike Perch, 2213; perch, 2156. Pike's Peak, 2214, 630, 632, 2434. Pilate, Pontius, 2214, 1454, 3079. Pilchard, 2214, 2449; herring, 1295. Pilcomayo River, 2214, 327, 2102. Pile, 2214; pile driver, 2214. Pilgrimages: Becket, 256; Damascus, 746; Fujiyama, 1077; Ganges, 1094; Mecca, 1745; Nikko, 1975.

Pilgrim Fathers, 2214, 1741, 2242.

Pilgrim Fathers, United Order of, 274.

Pilgrim's Progress, 406, 919. Pillar Dollar, 813. Pillar Saints, 2764. Pillar Saints, 2704.
Pillars of Hercules, 1139.
Pilling, James Constantine, 2214.
Pillory, 2215; torture, 2900.
Pillow, Gideon Johnson, 2215.
Pillsbury, Charles Alfred, 2215.
Pillsbury, John Sargent, 2215.
Pilot, 2215; pilotage, 2215.
Pilot, or Pilot Fish, 2216.
Pilot Knob, 1283, 1811.
Pilsen, Bohemia, 2216, 324.
Pin, 2216, 3167.
Pinakothek, Old and New, 1870.
Pincheck, 2216, 361.
Pinchers, 2216; nippers, 2216.
Pinckney, Charles, 2216, 2989.
Pinckney, Charles, 2216, 2989.
Pinckney, Thomas, 2217.
Pingon, Yanez, 80.
Pindar, 2217, 62, 520, 322, 1194.
Pindar, Peter. See WOLCOTT, JOHN, 3173.
Pine, 2217, 1001, 2717.
Pineapple or Anassa, 2218, 720, 1266. Pillars of Hercules, 1139. Pine, 2217, 1001, 2717.

Pineapple or Anassa, 2218, 720, 1266.

Pine Bluff, Ark., 2218, 145.

Pinero, Arthur Wing, 2218.

Pines, Isle of, 2218, 719.

Pine Tree State, 1678.

Ping Pong, 2219.

Pingree, Hazen Senter, 2219.

Pink, 2219, 2196; carnation, 485.

Pinkerton, Allan, 2219. Pinkerton, Allan, 2219. Pinnace, 2219, 320. Pintado, 1216. Pinto, Alexandre Serpa, 2219. Pinto, Alexandre Serpa, 2219.
Pinturicchio, Bernardino, 2220.
Pinzón, or Pinçon, Viceute Yanez, 80, 364.
Pipe, 2220, 442, 2042, 2777.
Pipe (tube), 2220, 2598.
Pipefish, 2220, 1303.
Pipit, or Titlark, 2220, 2884.
Piqua, Ohio, 2221.
Piquet or picket 2221 Piquet, or picket, 2221. Piracy, 2221, 68, 229, 1505, 2505; buccaneers, Piraeus, Greece, 2221, 176, 1193. Pisa, Italy, 2221, 518, 1087, 2997. Pisces, the Fishes, 2222, 3223. Pisiculture. See FISH CULTURE, 1005. Pisidia, Asia Minor, 2222, 166. Pisistratus, 2222, 1583. Pistil (in plants), 1020. Pistol. See Revolver, 2404. Piston, 2334, 2734. Pitcairn, John, 2223, 1579. Pitcairn Island, 2223. Pitch, 2223; pitch pine, 2817. Pitch (music), 1880. Pitcher Plants, 2223. Pith, or Medulla, 2224, 887, 891.

Pitman, Benn, 2224.
Pitman, Sir Isaac, 2224, 2620.
Pitt, Mount, 496, 2049.
Pitt, William, 2224, 1117.
Pitt, William, 2224, 1117, 2724.
Pittacus of Mitylene, 1574, 2595.
Pitti Palace, 2225, 1015.
Pittsburg, Kans., 2225, 1490.
Pittsburg, Pa., 2225, 2151, 2974.
Pittsfield, Mass., 2226.
Pittston, Pa., 2227.
Pius I., of Rome, 2227, 2273. Pittston, Pa., 2227.
Pius I., of Rome, 2227, 2273.
Pius II., Aeneas Sylvius, 2227.
Pius III., 2227.
Pius IV., 120, 2438.
Pius V., Michele Ghislieri, 2227.
Pius VII., 2227, 2270, 2274.
Pius VIII., 2227, 1026.
Pius VIII., 2227.
Pius IX., 2228, 120.
Pius X., 2228, 2274.
Pixies, 969.
Pizarro, Francisco, 2228, 74, 174 Pizarro, Francisco, 2228, 74, 174, 2169. Pizarro, Gonzalo, 2229. Place de la Bastille, 244, 2105, 2106. Place de la Concorde, 2106. Place de l'Etoile, 2106. Placenta, 910, 1909. Place Vendome, 2106.
Plague, or Glandular Pestilence, 2229, 927.
Plain, 2230, 139, 451, 1987, 2211.
Plainfield, N. J., 2230, 1945.
Plains of Abraham, 1836, 2348, 3174. Planché, Gustave, 1048.
Planché, Gustave, 1048.
Plane, 2230, 1116.
Plane (tool), 2230, 489.
Planetoid. See ASTEROID, 171. Plane Tree, 2230. Plane Tree, 2230.
Planets, 2231; astronomy, 173; Copernicus, 669; earth, 854; Galileo, 1087; Jupiter, 1479; Mars, 1715; Mercury, 1759; Neptune, 1921; Saturn, 2535; solar system, 2671; Uranus, 3000; Venus, 3030.
Plantagenet, 2231, 849, 922.
Plantain, 2232.
Plantain, tropical plant, 2232, 223. Plantain, tropical plant, 2232, 223. Planter State, 1912. Plants, 2232, 346, 688, 1020, 2579; herb, 1290. Planter State, 1912.
Plants, 2232, 346, 688, 1020, 2579; herb, 129
Plants, 2232, 346, 688, 1020, 2579; herb, 129
Plants, Maximus, 27.
Plasma (stone), 35; (blood), 314.
Plassey, Baron of, 605.
Plaster of Paris. See Gypsum, 1225.
Plata, Rio de la, 2233, 3003.
Plataea, Greece, 2233, 176, 3195.
Plateau, 2233, 162, 2434.
Plate Glass, 1150.
Plating. See Metallurgy, 1765.
Platinum, 2234, 547, 1766, 2702.
Platto, 2234, 874, 1194, 2178, 2195, 2670.
Platt, Orville Hitchcock, 2235.
Platt, Thomas Collier, 2235, 571, 654.
Platt-Deutsch, or Platt-German, 2236, 103.
Platte River, 2236, 1912.
Plattsburg, N. Y., 2236.
Plattsmouth, Neb., 2236, 1914.
Plauen, Germany, 2236.
Plautus, Titus Maccius, 2236, 826, 2445.
Playfair, Lord Lyon, 2237.
Plays. See Drama, 825.
Pleadings, 930, 2317.
Pleasonton, Alfred, 2237.
Plebeians, or Pleba, 2237, 37, 2442.

Plehve, Wjatscheslavo von, 2237, 95, 2472. Pleiades, 2237, 179. Pleione, 179, 2237. Pleistocene, 74, 1115, 1921, 2347. Pleistocene, 74, 1115, 1921, 2347. Plesiosaurus, 1115, 2398. Pleura, 2238, 1646. Pleurisy, 2238, 550, 2590. Pleurisy Root, 419. Plevna, 2061, 2476, 2944. Pliny the Elder, 2238, 914, 2445, 3237. Pliny the Younger, 2238, 2445, 2805. Pliocene, 2238, 1115, 1146. Ploughman. Piers, 1539 Pliocene, 2238, 1115, 1146. Ploughman, Piers, 1539. Plover, 2238; lapwing, 1543; stilt, 2745. Plow, 2239, 38, 2666. Plum, 2240, 122, 1198, 2324, 2654. Plumb, Preston B., 2240. Plumb, Preston B., 2240. Plumbago, 1182, 2145. Plumed Knight, The, 308; plumes, 982. Plummer, Mary G., 598. Plummet, or Plumb Line, 2240, 370. Plumule, 395, 1132, 2579. Plurality, 1682; quorum, 2358. Plush, 2240, 2411, 3026. Plutarch, 2240, 296, 1194. Pluto, 2241, 2289, 2321. Plutus, 2241. Pluviometer, 2370, 2369 Pluviometer, 2370, 2369.
Plymouth, England, 2241.
Plymouth, Mass., 2241, 1729, 2214.
Plymouth, Pa., 2241.
Plymouth Colony. See Pilgrim 2214. See PILGRIM FATHERS, Plymouth Rock, 2242, 59. Plymouth Sound, 2242. Pneumatic Dispatch, 2242, 2630. Pneumatics, 2242, 26. Pneumatic Tire, 2242, 290, 3134. Pneumatic Tools, 2243. Pneumonia, or Lung Fever, 2243, 1646. Pnum Pemh, Cambodia, 444. Petrovitch. Pobiedonostzeff, Constantine Po River, 2243, 24, 779. Pocahontas, 2243, 2373, 2658. Pocatello, Idaho, 2244, 1362. Pods, 252, 1318, 2130. Poe, Edgar Allan, 2244, 86, 2245. Poe, Orlando Metcalfe, 2244. Poerio, Carlo, 2245. Poet Laureate, 1548. Poetry, 2245, 825, 926, 1602, 1652; idyl, 1364; parody, 2113; pastoral, 2120. Poet's Corner, 3127. Poincaré, Jules Henry, 2245. Poincaré, Raymond, 2245, 1050. Pointer, 2246, 811. Point Europa, 1138. Point Lace, 1528; Point System, 313. Poison, 2246; alcohol, 57; belladonna, 270; hashish, 1262; hemlock, 1283; henbane, 2246; nightshade, 1975; nitric acid, 1979; prussic acid, 2326; strychnine, 2762; sulphuric acid, 2773; tartaric acid, 2821; toxicology, 2906. Poison Ivy. See Sumac, 2774. Poison Oak, 2774. Poisonous Plants, 2246, 15, 2009. Poitiers, or Poictiers, France, 2247, 877. Pokanokets, 1730. Pokeweed, 2247, 2246. Poland, 2247; language, 2248; literature, 2248; partition of, 507, 1059, 2247; revolts, 1520, 2247; Slavs, 2651; Sobieski, 1460.
Polar Bear. See Bear, 252.
Polar Circle. See Arctic, 135.
Polar Expeditions, 2248, 135, 664, 777, 1056, 1197, 1890, 2452.
Polarity, 2251; pole, 2252.
Polariscope, 2251, 2252.
Polarization of Light, 2252; of Heat, 1275.
Polar Lights. See Aurora Borealis, 186.
Pole, 2252; Netherlands, 1925.
Pole, 2252, 855, 929, 3224.
Pole, Reginald, 1721.
Polecat, 2252, 2649, 3109.
Polenz, Wilhelm, 1130.
Polestar, or Polaris, 2253, 253. Polenz, Wilhelm, 1130.
Polestar, or Polaris, 2253, 253.
Polevoi, Nikolaus, 2470.
Police, 2253, 1622.
Polillo, Island, 2254.
Polish Quadrilateral, 2343.
Political Economy, or Economics, 2254; banking, 225; commerce, 640; free trade, 1063; labor, 1525; monopoly, 1830; protection, 2321; reciprocity, 2384; socialism, 2667; tariff, 2819; wealth, 3109.
Political Geography, 1113. 2667; tariff, 2819; wealth, 3109.
Political Geography, 1113.
Political Offenses, 2256.
Political Parties in the United States, 2256; Abolitionists, 7; Anti-Federalists, 112; Anti-Masonic, 2257, 2597; Barnburners, 148; Bucktails, 394; Democratic, 779; Federal, 983; Free Soil, 1063; Greenback, 1198; Know-Nothings, 1515; Ku-Klux Klan, 1523; Liberal Republican, 1581; Liberty, 1582; People's, 2154; Prohibition, 2319; Republican, 2399; Socialist, 2667; Whig, 3136.
Polk, James Knox, 2261, 597, 2976.
Polk, Leonidas, 2262.
Polka, 748, 3079. Polk, Leonidas, 2202. Polka, 748, 3079. Pollen, 2262, 1020, 3107. Pollock, Sir Frederick, 2262. Pollock, Robert, 3247, 3249. Poll Tax, 2262, 2826. Pollux and Castor, 502, 907. Polo, 2262; water polo, 3103. Polo, Marco, 2262, 568, 1113. Polonium (chemistry), 547. Poltava, or Pultowa, Russia, 2263, 248. Polyandry, 1714, 2264. Polyarpt, 2263, 119. Polycrates, 2263, 2513. Polygamy, 2264, 872, 1714, 1850, 3210. Polygon, 2264. Polyhymnia, or Polymnia, 2264, 1878. Polymerism, 2264. Polymerism, 2264, 2077. Polynesia, 2264, 2077. Polynomial, 295. Polyp, 2265, 618, 672, 1347. Polyphemus, 2265, 15, 735, 1085. Polytechnic School, 2265. Polytheism, 2265, 1157; polytheists, 2394. Polyzoa, 2265. Pomade, 3022. Pombal, Sebastião, Marquis of, 2266. Pomegranate, 2266, 1110. Pomelo, 2600. Pomerani, 2266; Slavs, 2651. Pomerania, 2266, 2325. Pomeroy, Mark Miller, 2266. Pommona, or Mainland, Island, 2055.

Pomology, 1325; fruit, 1075.
Pomona, 2266.
Pomona, Cal., 2266.
Pompadour, Jeanne, Marquise de, 2267.
Pompeii, Rome, 2267, 3039, 3061.
Pompey, Cneius, 2268, 389, 429, 599, 2443, 2922.
Pompey's Pillar, 2268, 1179.
Pompic Way, 2034.
Ponca, 2268, 742, 2642.
Ponce, Porto Rico, 2284.
Ponce de León, Juan, 2268, 1018.
Poncho, 2269. Poncho, 2269. Pondicherry, India, 2269.
Pontchartrain, Fort, 790.
Pontchartrain, Lake, 2269, 1634.
Pontiac, 2269, 2066.
Pontiac, Mich., 2269.
Pontifex, 2269, 2270.
Pontifex, 2269, 2270.
Pontifex, 2270, 1815.
Pontoon, 2270, 1815.
Pony, 1324; Shetland, 2615.
Poodle, 2270, 293.
Poole, William Frederick, 2270.
Poona, or Puna, British India, 2271, 1377.
Poore, Benjamin Perley, 2271.
Poor Laws, 2271; poorhouses, 2272.
Poor Richard's Almanac, 74, 85, 1056.
Popayán, Colombia, 2272. Pondicherry, India, 2269. Poor Laws, 2271; poorhouses, 2272.
Poor Richard's Almanac, 74, 85, 1056.
Popayán, Colombia, 2272.
Pope, 2272, 273, 334, 441, 1202, 1390, 1460, 1570, 1718, 1971, 2125, 2227, 2644, 3000; cardinal, 481; conclave, 646; Papal States, 2098; vicar, 3041.
Pope, Alexander, 2274, 919, 3235, 3237, 3243.
Pope, John, 2274, 403, 2279.
Poplar, 2274, 167.
Poplin (fabric), 2275.
Popocatepetl, 2275, 3061.
Poppy, 2275, 1021, 2025, 2042.
Population, 2275; ethnology, 940.
Population, 2275; ethnology, 940.
Population, Center of, 2276, 1380.
Populist Party. See People's Party, 2154.
Porcelain. See Pottery, 2295.
Porcupine, 2276, 1278.
Porcupine River, 3212, 3213.
Pores, 2646, 2785.
Porgy, or Porgee, 2277.
Porifera (zoölogy), 2713.
Pork, 2277, 2009, 2792.
Porosity, 2277, 2334.
Porphyry, 2277; mineralogy, 1794.
Porpoise, 2277, 813, 2025, 2575.
Porta, Baptista, 2733.
Porta, Giambattista della, 2206.
Port Adelaide, Australia, 21. Porta, Baptista, 2733.
Porta, Giambattista della, 2206.
Port Adelaide, Australia, 21.
Portage, Wis., 2277.
Portal Veil, 1609.
Port Arthur, Manchuria, 2278, 565.
Port Arthur, Ontario, 2278.
Port-au-Prince, Hayti, 2278, 1272.
Port Chester, N. Y., 2278.
Portcullis, 2278, 501.
Port Darwin, Australia, 2278, 1034.
Port Flizabeth, South Africa, 2278. Port Elizabeth, South Africa, 2278, 68. Porte, or Sublime Porte, 660.
Porter, David, 2278, 938, 3084.
Porter, David Dixon, 2279, 1035.
Porter, Fitz-John, 2279, 403, 571, 1084, 2274.
Porter, Horace, 2279.

Porter Jane, 2279.
Porter, Mrs. David, 3249.
Porter, Noah, 2280.
Porter, Sir Robert Ker, 2280.
Port Hudson, Siege of, 2280.
Port Huron, Mich., 2280, 1780.
Portinari, Beatrice, 750. Port Huron, Mich., 2200, 1100.
Portinari, Beatrice, 750.
Port Jervis, N. Y., 2280.
Portland, Me., 2280, 1681.
Portland, Or., 2281, 2051.
Portland, Isle of, 2281.
Portland Cement. See Cement, 518.
Portland Vase, 2282, 1149.
Port Louis Mauritius. 2282, 1738. Port Louis, Mauritius, 2282, 1738. Port of Spain, Trinidad, 2282, 2920. Porto Rico, or Puerto Rico, Island, 2282, 113, 3126. 113, 3126.
Portree, Hebrides, 2649.
Port Said, Egypt, 2284, 883, 2768.
Portsmouth, England, 2285, 918.
Portsmouth, N. H., 2284, 1442.
Portsmouth, Ohio, 2284, 2024.
Portsmouth, Va., 2284, 3056.
Port Townsend, Wash., 2285.
Portugal, 2285; army, 2286; Braganza dynasty, 356, 364, 1461; colonies, 103, 200, 628, 1670, 2287, 2288; language, 363, 2287; literature, 2287; religion, 2287; Spanish Wars, 2288, 2697.
Portuguese East Africa, or Mozambique, Portuguese East Africa, or Mozambique, Portuguese East Africa, or Mozambique, 2288.
Portuguese Guinea, 2289.
Portuguese West Africa. See Angola, 103.
Port Wine, 2289, 3162.
Poseidon, 2289, 1921, 2241, 3219.
Posen, 2289, 2325.
Posen, Germany, 2289.
Positive Philosophy, or Positivism, 645, 2669.
Postal Savings Banks, 2539.
Post Office, 2290; dead letter, 764, 2291; free delivery, 2291; Postmaster-General, 2291, 2992; rates of postage, 2291; stamps, 2722.
Post-Tertiary, or Quaternary Age, 1115.
Potash, or Potassia, 2292, 28.
Potassium, 2292, 547, 1777, 2702.
Potato, 2292, 631, 2009, 2727.
Potato, Sweet, 2293, 3200.
Potato Bug, 263, 632, 1394.
Potato Fly, 2293.
Potential, 890; energy, 915.
Potomac, Army of the, 1657, 1743.
Potomac River, 2293, 549, 1721.
Potosí, Bolivia, 2293, 328.
Potpourri, 2294. 2288 Potosí, Bolivia, 2293, 328.
Potpourri, 2294.
Potsdam, Germany, 2294.
Potstone, 2294, 2809.
Pott, August Friedrich, 2294, 1177.
Pottawattamies, 2294, 2269.
Potter, Alonzo, 2294.
Potter, Henry Codman, 2294.
Potter, Paul, 2295.
Pottery, 2295; Assyrian, 171; Chinese, 564, 2295; Delft, 2295; Egyptians, 2295; Etruscan, 943; Kaolin, 985, 2296; Limoges, 1593; majolica, 1682, 2296; porcelain, 2295; Sèvres, 2597. 2397.
Pottstown, Pa., 2297, 2151.
Pottsville, Pa., 2297, 2151.
Poughkeepsie, N. Y., 2297, 3023.
Poultice, 325, 1883.
Poultry, 2297; duck, 837; egg, 879; goose,

1164; Guinea fowl, 1216; nutrition, 2009; peacock, 2131; pigeon, 2212; swan, 2784; turkey, 2940. peacock, 2940.
turkey, 2940.
Pound, 2298, 119, 199.
Pound (money), 2298, 1826.
Poussin, Nicolas, 2298.
Pouter (pigeon), 2212.
Powder. See Gunpowder, 1220. Powderly, Terence Vincent, 2298. Powell, John Wesley, 2298. Power, 2299, 196, 894; lever, 1577. Power of Attorney, 35. Powers, Hiram, 2299. Powers, the Great, 2299. Powers of Congress, 2984. Powhatan, 2299, 2243, 2658. Pownatan, 2299, 2245, 2008. Pownatans, 68. Poynter, Edward John, 2299. Pozzuoli, Italy, 2299. Praetor, 2300, 1585, 2442. Praetorian Guard, 2300. Pragmatic Sanction, 2300, 1707. Pragmatic Sanction, 2300, 1707.
Prague, Bohemia, 2300, 324.
Prague, University of, 2300, 2997.
Prairie, 2301; Great Plains, 2966; Ilanos, 1612; pampas, 2090.
Prairie Chicken. See Grouse, 1208.
Prairie Dog, 2301, 1712.
Prairie du Chien, Wis., 2301.
Prairie Squirrel, 1165, 2301.
Prairie State, 1365.
Prakrit. 2523 Prakrit, 2523. Prastragus, King of Iceni, 320. Pratt, Charles, 2301. Pratt, Enoch, 2302, 220. Pratt Institute, 2302. Praxiteles, 2302, 2536, 2569. Preble, Edward, 2302. Precession, 2302, 930, 2008. Precession, 2302, 930, 2008.
Precious Stones. See Stones, Precious, 2750.
Preferential Tariff, 454, 731, 2819.
Prentice, George Denison, 2303, 1605.
Prentice, George Denison, 2303, 1605.
Prentiss, Benjamin Mayberry, 2303.
Prentiss, Elizabeth P., 3250.
Prentiss, Sergeant Smith, 2303.
Preposition, 2303, 2117.
Preraphaelitism, 2303, 2452, 2464.
Presbyter, 2303.
Presbyterian, 2304, 691, 2322. Presbyter, 2303.
Presbyterian, 2304, 691, 2322.
Presbytery, 2304.
Prescott, Ariz., 2304, 143.
Prescott, William, 2304, 405, 1559.
Prescott, William Hickling, 2305, 88, 1605. Prescott, William Hickling, 2305, 88, 1605. Prescription, 2305.
Preserves, 587; pickles, 2210.
President, 2305, 653, 889, 2976, 2987, 3040.
Press, 2306, 169, 1953, 2160.
Press Association. See JOURNALISM, 1473.
Pressburg, or Presburg, Hungary, 2306, 1340.
Preston, England, 2306, 918.
Prestonpans, Battle of, 538.
Prestwich, Sir Joseph, 2307.
Pretender, Spanish. 483, 2698. Pretender, Spanish, 483, 2698. Pretender, The Young, 538, 870. Pretoria, South Africa, 2307, 2912. Prevailing Winds. See Wind, 3159. Prevention of Cruelty to Animals, Society for the, 278. Prévost, Eugène Marcel, 2307. Prevost, Sir George, 2307, 3085.

Preyer, Wilhelm Thierry, 2307. Priam, 2307, 1277, 2108, 2925. Pribilof, or Pribylov, Islands, 2307, **50, 279,** Price, Sterling, 2308, 676, 2237. Prichard, Colonel, 760. Prichard, James Cowles, 2308. Prichard, James Cowles, 2508.
Prickley Ash, 2308, 2535.
Priest, 2308, 1300, 1578, 2895.
Priestly, Joseph, 2308, 546, 2073.
Prim, Juan, 2309, 1053.
Prima Facie Evidence, 955. Prima Facie Evidence, 955.
Primates, 2309; animal, 104.
Prime, Samuel Irenaeus, 2309.
Prime, William Cowper, 2310.
Prime Minister, or Premier, 426, 1188.
Primitive Friends, 2345.
Primitive Methodists, 1769. Primogeniture, 2310. Primrose, 2310, 693, Prince, 2310, 21. Prince Edward Island, 2310, 455, 457. Prince of India, 3074. Prince of Wales, 2311, 3072. Prince Rupert's Drops, 2464. Prince of Wales, 2311, 3072.

Prince Rupert's Drops, 2464.

Prince's Feather, 79.

Princeton, Ind., 2312.

Princeton, N. J., 2312.

Princeton, Battle of, 2312, 2917.

Princeton University, 2312, 2997.

Printing, 2313; Caxton, 514; electrotyping, 897; Faust, 981; galley, 1089; Gutenburg, 1223; ink, 1389; monotype, 1831; journalism, 1473; Mergenthaler, 1761; type, 2950.

Printing Press, 2314, 2952.

Prior, Mathew, 3251.

Prism, 2315, 629; spectrum, 2703.

Prisoner of Chillon, The, 421, 1110.

Prisoners of War, 2315, 98, 1581.

Prisons, 2315, 98, 244, 754, 1939, 2914.

Pritchard, Jeter Connelly, 2316.

Privateer, 2316; letters of marque, 1575.

Privateer, 2316.

Privy Council, 2316, 425.

Privy Seal, 2317, 425.

Priv de Rome, 2507. Prix de Rome, 2507. Prixies, 969. Proa, 2317; boat, 320. Prod. 2317; boat, 320.
Probate Court, 2317, 3149.
Proboscis, or Trunk, 898, 899.
Probus, Marcus Aurelius, 2317.
Process, 2317; equity, 930.
Proctor, Adelaide Anne, 2318.
Proctor, Bryan Waller, 2318.
Proctor, Henry A., 2318, 2854, 3085.
Proctor, Richard Anthony, 2318, 25 Proctor, Richard Anthony, 2318, 2516. Production (in economics), 1525, 667, 2255. Profit, 2318; capital, 474; labor, 1525. Profit Sharing, 1558; Progression, 2318. Progressive Party, 2447, 3280. Prohibited City, 2145. Prohibition Party, 2319, 822, 2260, 2902. Prometheus, 2319, 790. Promised Land, 451. Promissory Note, 2319. Prongbuck, 110. Pronghorn, 2319. Pronoun, 2319, 2117. Proof Reading, 2320; printing, 2313. Propaganda, College of the, 3001. Propertius, Sextus, 3248.

Prophets, 2320, 1227, 1231, 1326, 1416, 1449, 1460, 1468, 1777, 1803, 1888, 2013, 3217. 1460, 1468, 1777, 1803, 1888, 2013, 3217
Proportis, Sea of, 1712.
Proportion, 2320, 141.
Prose, 2320; essay, 937.
Proserpina, or Proserpine, 2321, 23, 901.
Prosody (grammar), 1177, 1770.
Protagoras, 2321, 475, 2677.
Protection, 2321, 1064, 2384, 2819.
Protector, 2321, 710, 921.
Proteids, 2321, 1027, 2207, 2748.
Protein, 2321, 296.
Protesilaus, 2321. Protesilaus, 2321. Protesiaus, 2321.
Protestants, 2322, 1891, 2388, 2394.
Proteus, 2322; Neptune, 1921.
Protoplasm, 2322, 296, 517, 2207.
Protozoic Zase, 256, 1030; protozoilogy, 2325.
Protozoic Era. See Geology, 1114.
Providen Pierra Joseph 2329, 2925. Proudhon, Pierre Joseph, 2322, 2255. Proud Flesh, 1029. Proudhon, Pierre Joseph, 2322, 2255.
Proud Flesh, 1029.
Provençal, 2323; troubadours, 2924.
Provence Rose, 425.
Proverbs, 2323, 289, 2673.
Providence, R. I., 2323, 2978, 3153.
Providence Plantations, 617.
Province, 457, 2730, 2731.
Provo City, Utah, 2324, 3006.
Prowse, Daniel Woodley, 2324.
Pro-zymites, 201.
Prunes, 2324, 2240.
Pruning, 2325; root pruning, 2325.
Prusias I., of Bithynia, 388.
Prussia, 2325; Austrian Wars, 196, 1052, 1059, 1707; Brandenburg, 359; Franco-German War, 301, 1050, 1131, 3152; Hanover, 1249; Hesse, 1296; Hohenzollern, 1311; Napoleonic Wars, 317, 1061, 1896; Pomerania, 2266; Posen, 2289; Saxony, 2542; Seven Years' War, 1059, 1707; Silesia, 2634; Westphalia, 3128.
Prussian Blue, 317, 2081.
Prussic Acid, 2326, 15, 75.
Pruth River, 2326, 751.
Przemysl, Galicia, 2326, 1086,
Psalms, Book of, 2326, 159, 289, 3251.
Pseudomorphism, 1795.
Pseudonyms, 2326; Pseudopodia, 91.
Psyche, 2327; cupid, 725, 3030.
Psychology, 2327, 9, 120, 170, 827, 984, 1396, 1793, 2136, 2156, 2678.
Ptarmigan, 2328, 1208.
Pteridophytes, 2329; cryptogams, 2329.
Pterodactyl, 2329, 823, 2398. Ptarmigan, 2328, 1208.
Pteridophytes, 2329; cryptogams, 2329.
Pterodactyl, 2329, 823, 2398.
Pterosauria, 1480.
Ptolemaic System, 173, 2329.
Ptolemais, Svria, 16.
Ptolemy, 2329, 63, 884.
Ptolemy, La Soter, 2329, 64, 1583.
Ptolemy, Claudius Ptolemaeus, 2329, 126, 173, 1194 1194. Ptolemy, Philadelphus, 669, 1589. Ptomaine, 2329, 208.
Ptyalin, 799, 2505.
Public Land, 1316, 2302, 2782.
Public Schools. See Education, 872; Schools, 2553.Puck, or Robin Goodfellow, 2329. Puddling, 1410, 2437. Puebla, Mexico, 2330, 1775. Pueblo, Col., 2330, 1775. Pueblo Indians, 2330, 1948. Puerto Príncipe, Cuba, 2331, 720. Puerto Rico, or Porto Rico, 2282.

Puffendorf, Samuel, 2331. Puff Adder, 2331, 20. Puffball, 2331; fungi, 1078. Puffin, 2331; penguin, 2147. Pug, 2331, 811. Puget Sound, 2331, 3093. Pugh, James Lawrence, 2332. Pugli, Francesco di, 2540. Pul (Tiglath-Pileser), 170, 204. Pulaski, Casimir, 2332, 2538. Pulaski, Casimir, 2002, 2006. Pulcheria, of Byzantium, 422. Pulitzer, Joseph, 2332, 1581. Pulley, 2332, 1746, 2543. Pullman, George Mortimer, 2333, 2367. Pullman Palace Car Co., The, 2333. Pulgue, 2333, 35 Pullman Palace Car Co., The, 2333.
Pulque, 2333, 35.
Pulsatilla, or Pasque Flower, 2333.
Pulse, 2333, 155, 1085; vegetable, 3025.
Pultowa, 248, 538, 2263.
Puma, or Cougar, 2334, 688, 1599, 2097.
Pumice, 2334, 2085.
Pump, 2334, 44, 3104.
Pumpkin, 2335, 1172; squash, 2718.
Punch, 2335; beverage, 2335.
Punch and Judy, or Punchinello, 2335.
Punctuation, 2335, 2320.
Punic Wars, 2336, 494, 1241, 2443, 2560.
Punjab, or Panjab, 2336, 1376.
Punjab University, 1532.
Pupa, or Chrysalis, 419, 577. Punjab University, 1532.
Pupa, or Chrysalis, 419, 577.
Pupin, Michael I., 2838.
Puppet Show, 2335.
Purari River, 286.
Purdue University, 2336, 1530.
Purgatory, 2337, 751, 1196.
Purim, Feast of, 938.
Puritans, 2337, 922, 2214.
Purple Dye, 2953.
Pusey, Edward Bouverie, 2337, 1946.
Pushkin, Alexander, 2470. Pushkin, Alexander, 2470. Put-in-Bay, Ohio, 2337, 2162, 3084. Putlitz, Gustav Heinrich zu, 2004. Putnam, Conn., 2337.
Putnam, George Palmer, 2337.
Putnam, Israel, 2338, 405.
Putnam, Rufus, 2338.
Putrefaction, 2338; embalming, 909. Putnam, Rufus, 2338.
Putrefaction, 2338; embalming, 909.
Puy-de-Dôme, Mount, 198.
Pydna, Battle of, 2443.
Pye, Henry James, 2338, 1548.
Pygmalion, 2338.
Pygmies, 2338; dwarfs, 847.
Pylades (mythology), 2052.
Pyle, Howard, 2339.
Pylorus, 2208, 2748.
Pym, John, 2339.
Pyramid, 2339, 547, 884, 2253.
Pyramids, Battle of, 1895.
Pyramids, Battle of, 1895.
Pyramus and Thisbie, 2340.
Pyrenees Mountains, 2340, 2694.
Pyrites, 2340, 1225, 2854, 2881.
Pyrometer, 2340; thermometer, 286
Pyroxene, or Augite, 2340.
Pyroxylin, 1219.
Pyrrha, 790.
Pyrrho, 780, 1194; philosophy, 2195.
Pyrrhus, 2341, 100, 928.
Pythagoras, 2341, 173, 1254, 2195.
Pytheas, 116.
Pythia, (mythology), 2044 Pytheas, 116.
Pythia (mythology), 2044.
Pythia Games, 2341, 778, 1093, 1790.

Pythias. See Damon, 746. Python, 2341, 319, 2663. Python (mythology), 2342. Pyx, 2342; trial of the pyx, 2342. Pyxie, 2342; (fairy), 969.

O

O, 2343, 2951.

Quackenbos, George Payn, 2343, 875, 2406.
Quad, M., 1578, 2327.
Quadrant, 2343, 866.
Quadriga, 2343; chariot, 534.
Quadrilateral, 2343; fortification, 1035.
Quadrille, 2343, 748.
Quadrumana, 2343, 1687, 1828.
Quadrupeds, 854, 1143, 1268, 1687, 2309.
Quadruple Alliance, 2343.
Quaestor, 2344.
Quagga, 2344; zebra, 3216.
Quagmire, 323, 1716.
Quail, 2344, 1093; partridge, 2117.
Quaker Poet, 238.
Quakers, 2344, 230, 1043, 2148, 2152.
Qualifications of Congressmen, 653, 2984.
Quamash, or Biscuit Root, 2345.
Quapaw, 2345.
Quapaw Reservation, 1343.
Quarantine, 2345, 1009.
Quarles, John, 3252.
Quarles, John, 3252. Quarantine, 2345, 1009. Quarles, John, 3252. Quart, 2346, 1089. Quartermaster, 2346. Quartet, 2346, 1270. Quartz, 2346, 526, 1014, 1160, 1794. Quartzite, 2346. Quassia, 2346, 2894. Quaternary Period, 2347, 35, 1115. Quassia, 2346, 2894. Quaternary Period, 2347, 35, 1115. Quay, 1251, 3132. Quay, Matthew Stanley, 2347. Quayle, William Alfred, 2347. Quebec, 2348, 455, 600, 1526. Quebec, Quebec, 2347, 242, 455, 1836, 3174. Quebec, Mattle of, 2350, 1836, 3174. Quebec, Quebec, 2347, 242, 455, 1836, 3174. Quebec, Battle of, 2350, 1836, 3174. Quebec Act, 2351. Queen, 2351, 21, 1824. Queen Anne's War, 1067. Queen Charlotte Islands, 2351, 376. Queen Charlotte Sound, 2351, 3016. Queen of Sheba, 10, 125, 940. Queen's College, 265, 1406. Queen's Cup, 3198. Queensberry, John Sholto Douglas, 2351. Queensberry Rules, 353, 2351. Queensland, 2351, 190, 192. Queenstown Heights, Battle of, 2353, 379. Queenstown, Ireland, 2353, 2733. Quelpaert, or Tamra, Island, 2353. Querfatro, Mexico, 2353, 1775, 1805. Quern, 2353; mill, 1788. Quesada, Ximenes de. See Ximenes, 3196. Quetzal, or Quesal, 2354; trogon, 2922. Quetzalcoatl, 2354; Aztecs, 201. Quezaltenango, Guatemala, 2354, 1212. Quick, Robert Herbert, 2354. Quicklime, 1593. Quicksands, 2354; sand, 2515. Quicksilver, 1760; mercury, 547. Quiller-Couch, Arthur Thomas, 2354. Quillota, Chile, 2354. Quills, 298, 982, 2144.
Quimby, Dr. Phineas P., 869.
Quin, James, 2354.
Quince, 2355; fruit, 1075.
Quince, Georg Hermann, 2355.
Quincy, Ill., 2355, 1367.
Quincy, Mass., 2355.
Quincy, Gedmond, 7.
Quincy, Josiah, 2355.
Quincy, Josiah, 2356, 85.
Quincy, Josiah, 2356, 85.
Quinet, Edgar, 1048.
Quinine, 2356, 582, 854, 2860.
Quinoa, 2356.
Quinoa, 2356.
Quinoa, 2356.
Quinoa, 2357.
Quirinal Hill, 2357, 2480.
Quipu, 2357.
Quirinal Hill, 2357, 2480.
Quirinus, 2357; Quirinalia, 2357.
Quirites, 2357.
Quirtes, 2357.
Quitclaim, 2357, 771.
Quito, Ecuador, 2357, 868.
Quoits, 2357.
Quorum, 2358, 653, 2112, 2985.

R

R, 2359, 2951.
Raab River, 193, 195.
Rabbat, Morocco, 2359, 1852.
Rabba, Western Africa, 2359.
Rabbah, 2359.
Rabbi, 2359, 2799; rabin, 2359.
Rabbit, 2359, 1252, 2919.
Rabelais, François, 2360, 1048.
Raccoon, 2360, 1988.
Raccoon, 2360, 1988.
Racces of the World. See Ethnology, 940.
Rachel. See Jacob, 1431.
Rachel, Eliza, 2361.
Racine, Jean Baptiste, 2362, 826, 1821.
Racine, Wis., 2361, 3169.
Rack. See Torture, 2900.
Raclawice, 1520.
Radcak Island, 2264.
Radcliffe, Ann Ward, 2362.
Radcliffe College, 2362.
Radcliffe, Ann Ward, 2362.
Radiata, 2362, 105, 1115, 2322, 2727.
Radiator, 2362; radiation of heat, 1275.
Radiometer, 2363, 711.
Radish, 2363: Radium, 2363, 547.
Radom, Poland, 2363.
Rae, John, 2363, 2248.
Raff, Joseph Joachim, 2363.
Rae, John, 2363, 2248.
Raffia, 2364; raffia weaving, 2364.
Raffiaelli, Jean François, 2364.
Raffia, 2364; raffia weaving, 2364.
Raglan, Fitzroy James, Lord, 2364, 1510.
Ragnarök, 2364.
Ragstone, 2364; limestone, 1593.
Rag Trade, 2364; paper, 2098.
Ragusa, Austria, 2365.
Ragweed, 2365; weeds, 3115.
Rahway, N. J., 2365.
Raikes, Robert, 2365, 2778.
Rail, 2365, 663.
Railroads, or Railways, 2365, 314, 359, 2740; gyroscope, 1226.

Railroads, Electric, 895, 2630. Rain, 2368, 791, 1232, 2665. Rainbow, 2369, 629, 1240. Rain Gauge, 2370, 2369. Rainy Lake, 2370, 1800. Raisin, 2370; grape, 1181. Raisin River, 1778. Raisin River, Battle of, 2370. Raisin River, 1778.
Raisin River, Battle of, 2370, 2882.
Rajah, or Raja, 2370.
Rajputana, 2370, 2336.
Rake, 2370; horse rakes, 2370.
Rákôczy, Francis, 1339.
Raleigh, N. C., 2370, 1992.
Raleigh, Sir Walter, 2371, 888, 1140, 1992.
Ram, 2371, 1911.
Rāma, 2372, 357, 3057.
Ramadan, 2372, 1819.
Rāmāyana, 2372, 3057.
Rambaud, M. Alfred Nicholas, 1048.
Ramée, Louise de la, 2372, 2327.
Rameses II., 2372, 884, 1455, 1755.
Rameses III., 2372, 884, 1455, 1755.
Rameses III., 2372; Pharaoh, 2179.
Ramesseum, 2372.
Ramillies, or Ramilies, Belgium, 2372.
Ramillies, or Ramilies, Belgium, 2372.
Ramillies, or Ramilies, Belgium, 2372.
Ramsey, Alexander, 2372.
Ramsey, Alexander, 2372.
Ramsey, Allan, 2563.
Ramsey, Sir Andrew, 138.
Ramsey, Sir Andrew, 138.
Ramsey, Sir William, 2373, 1523.
Ranavalona II., of Madagascar, 1669.
Ranc, Arthur, 2373.
Ranch, 2373, 2447.
Randall, Samuel Jackson, 2373.
Randolph, Edmund Jennings, 2373.
Randolph, John, 2373, 541, 597. Raisin River, Battle of, 2370, 2832. Randall, Samuel Jackson, 2373.
Randolph, Edmund Jennings, 2373.
Randolph, John, 2373, 541, 597.
Randolph, Peyton, 2373.
Rangoon, Burmah, 2374, 411.
Ranjit Singh, 2374.
Rank. See Relative Rank, 2394.
Ranke, Leopold von, 2374, 1130.
Ransom, Mathew Whitaker, 2374.
Ranuculus, 2374, 418.
Rape, 2375, 1027, 2025, 2104.
Raphael, or Raffaello, Sanzio, 2375, 238, 2081.
Rapidan River, 1180, 2375.
Rapier, 2375; sword, 2796.
Rappahannock River, 2375, 1060.
Raptorea, 298; vultures, 3065.
Raratonga, 3153.
Raritan River, 2375, 1944.
Rash, Nettle, 1928.
Rask, Rasmaus Christian, 2375, 725.
Rasores, or Scratchers, 298. Rash, Nettle, 1926.
Rask, Rasmaus Christian, 2375, 725.
Rasores, or Scratchers, 298.
Rasp, 998.
Raspberry, 2375, 304.
Raspe, Rudolf Erich, 1869.
Rat, 2376, 2919; hair dressing, 1233.
Ratchet, 2376.
Ratel, 2376; badger, 209.
Ratio. See Proportion, 2320.
Rationalism, 2376, 1063.
Rationalism, 2376, 1063.
Ration, New Mexico, 2376, 1948.
Rat Portage, or Kenora, Ontario, 2377.
Rattan, 2377; rope, 2448.
Rattlesnake, 2377, 2663, 3052.
Rauch, Christian Daniel, 2377, 540, 2570.
Rauches Haus, 2378, 3145.

Raven, 2378; crow, 714. Raveners (raptores), 298. Ravenna, Italy, 2378, 1421. Rawlins, Wyo., 2378, 3193. Rawlins, John Aaron, 2378. Rawlins, Wyo., 2378, 3193.
Rawlins, John Aaron, 2378.
Rawlinson, George, 2378.
Rawlinson, George, 2378.
Rawlinson, Sir Henry, 2379, 264, 725.
Ray, 2379, 2541, 2645.
Ray, or Wray, John, 919.
Rayleigh, Lord John, 138.
Raymond, Henry Jarvis, 2379.
Razor, 2379, 2840; barber, 229.
Razorbill, 185, 2647.
Re, 2379; Son of Re, 2379.
Ré, Island, 2379; Biscay, 300.
Read, Deborah, 1056.
Read, George, 2989, 2995.
Read, Opie Percival, 2379.
Read, Thomas Buchanan, 2379, 515.
Reade, Charles, 2380, 920.
Reade, John, 2380.
Reading, 2380, 1582, 1604, 2359.
Reading, Mass., 2381.
Reading, Mass., 2381.
Reading, Pa., 2381, 2151.
Reagan, John Henninger, 2381.
Real Estate, 2382, 543, 2166.
Realism. See Idealism, 1363.
Real Schools, or Realschulen, 2382, 194, 618.
Reaper, Inventor of, 1658.
Reaping, 2382, 39, 1261.
Reason, 2382, 2328.
Reason, Age of, 85, 2080.
Réaumur, René Antoine, 2383, 2861. Reason, Age of, 85, 2080. Réaumur, René Antoine, 2383, 2861. Reaumur Thermometer, 772, 2861. Reaumur Thermometer, 772, 2861.
Rebellion of 1838, 2383.
Récamier, M. Jacques, 2383.
Récamier, Madame, 2383.
Receipt, 2383, 293.
Receiver, 2383; bankruptcy, 227.
Receptacle, or Torus, 1020.
Rechabite, 2384.
Rechabites, Independent Order of, 274, 2384.
Recipter, See PERNAMBUCO, 2160. Recife. See Pernambuco, 2160. Recife, Cape, 68. Reciprocity, 2384, 308, 1258. Recitative, 2384, Recollection, 1754.
Reconstruction, 2384, 1463, 1595.
Record, 2385, 771.
Red, 2385, 629, 2369.
Red Bank, N. J., 2385.
Redbreast. See Robin, 2429.
Red Cedar, 515, 1478.
Red Cloud, 2385.
Red Cross Society, 2385, 82, 239, 1686.
Red Cross Society, 2385, 82, 239, 1686.
Redditch, England, 1917; Redfish, 2386.
Redgrave, Richard, 2386.
Red Jacket, 2386, 1413.
Red Men, Improved Order of, 2386, 274.
Redmond, John Edward, 2386, 1316.
Red Prince, 1060. Recollection, 1754 Redmond, John Edward, 2386, 1316. Red Prince, 1060. Red River, 2386, 1634, 1807. Red River, or Song-Koi, 2386, 1249. Red River Expedition, 227, 1057. Red River of the North, 2386, 1800. Red Sea, or Arabian Gulf, 2386, 124. Redstart, 2387. Redtop, 2387, 1269; grass, 1182. Red Wing, Minn., 2387, 1802. Redwood, 2387, 2589; forest, 1031.

Red Wood Library, 1951. Reed, 2387; reed organ, 2053. Reed, Thomas B., 2387, 352, 1284, 2358. Reedbird, 321. Reed Pens, 2144.
Reeves, John Sims, 2388.
Referendum, 2388; local option, 1613.
Reflection, 2388, 2328.
Reflex Action, 2388, 1131, 1344, 1647, 1751, Waldenses, 3071. denses, 3071.
Reformatory, 1386, 2315.
Reformed Church, 2389, 1648.
Reform School, 2390, 1386.
Refraction, 2390, 962, 1588, 2315, 2369.
Refrigerator, 2390, 1357.
Refrigeration, 2390; ice, 1357. Regelation, 2390; tee, 1357. Regelation, 2390; freezing, 1064. Regeneration, 2390; baptism, 228. Regensburg, or Ratisbon, Germany, 2391. Regent, 2391, 2351. Regent Diamond, 794. Regent Street, 1621.
Regillus, Lake, 2391.
Regiment, 2391, 159, 247.
Regina, Saskatchewan, 2391, 2534.
Regina, Saskatchewan, 2391, 2534. Reginat, Saskatchewan, 2591, 2554. Registered Mail, 2292. Regnault, Alexandre Georges, 2391. Régnier, Henri de, 2391, 1048. Regulus, Marcus Attilius, 2391. Rehan, Ada, 2392. Rehoboam, 1450, 1456 Reichenbach, Karl, 2392, 1764. Reichsrat, 195. Reichenbach, Karl, 2392, 1704.
Reichsrat, 195.
Reichstadt, Napoleon François, 2392, 1896.
Reichstag, 404, 1128, 2326.
Reid, Mayne, 2392.
Reid, Robert Gillespie, 2392.
Reid, Thomas, 2392.
Reid, Whitelaw, 2393.
Reign of Terror, 2429.
Reikiavik, or Reykjavik, 2393, 1358.
Reindeer, 2393, 771.
Reinecke, Karl, 525.
Reis, Philip, 2838.
Reiss, William, 686.
Rej, Nicolas, 2248.
Relationship, 2393, 28, 1279.
Relative Rank, 2394; army, 149.
Religion, 2394, 357, 396, 575, 651, 834, 843, 1519, 1849, 2114, 2142, 2157, 2389, 2510, 2602, 2615, 2634, 3225; mysticism, 1885; theology, 2859.
Religious Liberty, 2395, 2214.
Rembrandt, Hermensz Van Ryn, 2395, 2081.
Remenyi, Eduard, 2395.
Remington, Frederic, 2395.
Remington, Typewriter, 2952 Remington, Frederic, 2395. Remington Typewriter, 2952. Remsen, Ira, 2395, 2480. Remus, 2440, 2442, 2446. Rémusat, Abel, 285. Rémusat, Charles François, 2396. Renaissance, 2396, 2389, 2553. Renaissance, 2396, 2389, 2553.
Renan, Joseph Ernest, 2396.
Rennes, France, 2396.
Rennes, or Whey, 545, 1787.
Rennie, John L., 372.
Reno, Nev., 2396, 1931.
Renouvier, M., 1048.
Rensselaer, N. Y., 2397.
Rensselaer, Polytechnic Institute, 2926.
Rent, 2397; tenant, 2841.
Renwick, James. 2397. Renwick, James, 2397.

Reports, 318. Repplier, Agnes, 2397. Representatives, House of, 653, 1370, 2984. Reprieve, 2397, 2104. Reproduction, 296; egg, 879; embryology, 910; seed, 2579. Reptiles, 2397, 529, 672, 708, 1611, 2899. Republic, 2398; democracy, 779. Republic, Grand Army of the, 1177. Republican Party, 2399, 779, 2259, 2976. Repudiation, 2400; debt, 767. Repudation, 2400; debt, 767.
Resaca de la Palma, Battle of, 2400, 2829.
Reservation, 2400; Indian, 1381.
Reservoir, 2400, 123, 3104.
Resins, 2400; gum, 1218.
Respiration, 2400, 1645.
Restigouche River, 2402, 1934.
Resurrection, 2402, 2482, 2594.
Reszke Lean de See De Reszke Lean 78 Reszke, Jean de. See De Reszke, Jean, 786. Retainer, 2402. Retina, 961, 962. Retirement, 2402. Retort, 2402, 804. Retreat of the Ten Thousand, 737, 3195. Retz, Jean François de, 1048.
Reuben, 1141, 1455.
Réunion, 2402, 643, 1047.
Reuter, Fritz, 2402, 2236.
Reval, or Revel, Russia, 2403.
Revelation, Book of, 2403, 288, 289, 1461, 3250.
Revenue, 731, 2722; bills for, 2985.
Revere, Mass., 2403.
Revere, Paul, 2403, 1579.
Revival, 2403; (of learning), 2403, 2396.
Revolution, 2404, 1049, 1050, 1131, 1477.
Revolutionary War in America, 2979, 2404;
Brandywine, 360; Bunker Hill, 405; Charleston, 539; Concord, 646; Cowpens, 692; Declaration of Independence, 769; Germantown, 1124; King's Mountain, 1510; Lexington, Retz, Jean François de, 1048. 1124; King's Mountain, 1510; Lexington, 1579; minutemen, 1804; Monmouth, 1829; Princeton, 2312; Saratoga, 248, 2528; Stamp Act, 2722; Stony Point, 2750; Trenton, 2916; Yorktown, 3208. Yorktown, 3208.
Revolution of 1848, 196, 1050, 1131, 2404.
Revolver, 2404, 633.
Reynard the Fox, 2404.
Reynolds, John Fulton, 2405, 2436.
Reynolds, Sir Joshua, 2405, 353.
Rezin, of Syria, 41.
Rhadamanthus, 2405, 1803.
Rhaetia, 2440, 2954.
Rhaetian or Rhetian Alos 20, 193 Rhaetia, 2440, 2954.
Rhaetian, or Rhetian, Alps, 20, 193.
Rhaetians, 2795.
Rhamnus, City of, 1921.
Rhea, 2405, 2062.
Rhea, or Cybele, 2405, 523, 2883; satellite, 2535.
Rhea Silvia, 2440, 2442, 2446.
Rheims, or Reims, France, 2405, 1459.
Rhenish Prussia, 44, 612, 2325, 2406.
Rhetoric, 2406, 997.
Rheumatism, 2406, 1283, 1644, 1928.
Rhine, or Rhein, River, 2406, 1125.
Rhinelander, Wis., 2406.
Rhine Province, 2406, 846.
Rhinoceros, 2407, 32.
Rhizopods, 2322, 2653.
Rhode Island, 2407, 818, 1021, 2978.
Rhodes, Island, 2409, 633, 779, 1750.
Rhodes, Island, 2409, 633, 779, 1750.
Rhodes, Cecil John, 2409. Rhodes, Cecil John, 2409. Rhodes, James Ford, 1605. Rhodes, Colossus of, 633, 2409, 2595.

Rhodesia, 2409, 376. Rhodes Scholarships, 2410. Rhododendron, 2410.
Rhodium (chemistry), 547, 1766, 2
Rhone River, 2410, 1109.
Rhubard, or Pie Plant, 2410.
Rhyme, 2411, 2245.
Ribbon, 2411, 1234, 2635.
Ribbon Fish, 2411, 2012, 2575.
Ribot, Théodule Armand, 2411, 845.
Ribs, 2411, 2646.
Ricardo, David, 2411 Rhododendron, 2410. 547, 1766, 2234. Ribs, 2411, 2646.
Ricardo, David, 2411.
Rice, 2412, 1027, 1176, 2009, 2501.
Rice, Alice Hegan, 2412.
Rice-bird, 321; bunting, 321.
Rice Paper, 2412; paper, 2098.
Richard I., of England, 2412, 717, 922, 2185.
Richard II., of England, 2413, 1286, 2232, 3106.
Richard III., of England, 2413, 346, 878, 1286.
Richard, Duke of York, 2451, 3208.
Richardson, Henry Hobson, 2413.
Richardson, Samuel, 2413, 920, 919.
Richardson, Sir John, 2248, 2363.
Richardson, William Adams, 2414.
Richelieu, Duke of, 2414, 11, 457, 1049, 1334, 1632. 1632. 1632.
Richmond, Ind., 2414, 1379.
Richmond, Va., 2415, 649, 1180.
Richmond, Leigh, 2416.
Richter, Eugene, 2416.
Richter, Hans, 2416.
Richter, Jean, 2416, 618, 1130.
Richter, Johann, 2416. 2327, 3242, 3251, 3256.
Ricketts, James Brewerton, 2417.
Riddler, Herman, 2417.
Riddle, 2417, 2020.
Riddle of the Sphinx, 2020, 2706. Riddle, 2417, 2020.
Riddle of the Sphinx, 2020, 2706.
Rideau Canal, 2417, 2040.
Rideau River, 2417, 2065.
Ridgway, Robert, 2417.
Riding, 2417; race, 2361.
Ridley, Nicholas, 2418, 697, 922, 1547.
Ridpath, John Clark, 2418, 88.
Riel, Louis, 2419, 458, 2534.
Rienzi, Cola di, 2419.
Riesengebirge, or Giant Mountains, 24 Rienzi, Cola di, 2419.
Riesengebirge, or Giant Mountains, 2419, 887.
Rietschel, Ernest, 2419.
Rifle, 2420, 149, 916.
Riga, Gulf of, 2421, 220.
Riga, Russia, 2420, 2470.
Riggs, Elias, 2421.
Riggs, Kate Douglas Wiggin, 2421.
Riggs, Kate Douglas Wiggin, 2421.
Riggs, Stephen Return, 2421.
Right of Way, 2421.
Rigi, or Righi, Mountain, 2421.
Rigsdag (Denmark). 782. Rigsdag (Denmark), 782. Rig-Veda, 357, 3024. Riis, Jacob August, 2421. Riley, James Whitcomb, 2421, 88, 3237, 3239, 3246. Rimini, Italy, 2422. Rinderpest, or Cattle Plague, 2422. Rinehart, William Henry, 2422, 2570. Ring, 2422; signet ring, 2422. Ring Ouzel, 2422; ouzel, 2068. Ringworm, 2423. Rinkart, Martin, 1353. Rio de Janeiro, Bay of, 364, 2423. Rio de Janeiro, Brazil, 2423, 364. Rio Grande, River, 2423, 2425, 2851. Rio Negro, River, 2423, 80, 499. Riot, 2423, 1964. Rimini, Italy, 2422.

Riparian Rights, 2423. Ripley, George, 2424, 381. Ripon Falls, 1976. Rip Van Winkle, 2424, 86, 1415. Rip Van Winkle, 2424, 86, 141 Ristori, Adelaide, 2424. Ritter, Carl, 2424. Rittinghusen, William, 2099. Ritual, 2425; pontifical, 2270. River, 2425, 778, 3100. River Land Settlers, 2425. Riverside, Cal., 2426. Rivers, Amélie, 2426. Rives, Amélie, 2426. Riviera, 2426. Rixdorf, Germany, 2426. Rizzio, David, 1723. Roach, John, 2426. Road, 2426, 1300, 2421. Road, Macadamization of, 1654. Roanoke, Va., 2427, 3056. Roanoke River, 2427, 53, 1990. Robbery, 2427, 705. Robbia, Della, 2427. Robbins, Benjamin, 1220. Robbins, Benjamin, 1220. Robert of Normandy, 3151. Robert II., of Scotland. See Bruce, 386. Robert III., of Scotland, 2427, 820, 2762. Robert III., of Scotland, 2427, 2564. Robert the Good, 1026. Robert the Red, 2430. Roberts, Brigham Henry, 2428. Roberts, Charles George, 2428. Roberts, David, 2428. Roberts, Sir Frederick, 2428, 402. Roberts Institute, 1532 Robertson, Frederick William, 2428. Robertson, George, 197. Robertson, James, 2428. Robespierre, Maximilien, 2429, 642, 1431. Robin, 2429, 2872. Robin Redbreast, 2429, 2889. Robinson Edward, 2429. Robinson, Edward, 2429. Robinson, Sir Hercules, 1283. Robinson Crusoe. See Juan Fernandez, 1474. Robinson Crusoe. See JUAN FERNANDEZ Rob Roy, 2430. Rob Roy (John Macgregor), 1662, 2327. Robsart, Amy, 1565. Roc, or Rukh, 2430. Rochambeau, Jean Baptiste, 2430. Rochdale, England, 2430. Roche, Marquis de la, 457. Rochefort France, 2430. Rochefort, France, 2430. Rochefort, Victor Henri, 2430. Rochelle, La, France, 2430, 1334. Rochelle Salt, 2580. Rochester, Minn., 2431. Rochester, N. H., 2431, 1942. Rochester, N. Y., 2431, 2975. Rochester, John Wilmot, 3252. Rockaway, 491. Rockefeller, John Davidson, 2432, 556. Rockefeller, William, 2432. Rocket. See FIREWORKS, 1004. Rocket, The, 2735, 2740. Rockford, Ill., 2432, 1367. Rockford, Ill., 2432, 1367.
Rock-hewn Temples, 907.
Rock Hill., S. C., 2432.
Rocking Stones, or Logan Stones, 2432.
Rock Island, Ill., 2432, 758.
Rockland, Me., 2432, 1681.
Rockland, Mass., 2432.
Rock River, 2433, 1365.
Rocks, 1114; agate, 34; basalt, 239; boulder, 349; clay, 596; erratic boulder, 934; fault, 981; felspar, 985; flagstone, 1010; gneiss, 1155 granite, 1179; gravel, 1183; hornblende, 1323; Iceland spar, 1359; igneous, 1364; lava, 1550; limestone, 1593; marble, 1704; metamorphic, 1766; quartz, 2346; sand, 2515; sandstone, 2517; serpentine, 2590; shale, 2603; slate, 2649; soapstone, 2667; stone circles, 2750; trap, 2913.

Rock Springs, Wyo., 2433, 3193.

Rocky Mountain Goat, 2433, 1156.

Rocky Mountain Goat, 2433, 1156.

Rocky Mountains, 2433, 1987, 2966.

Rocroy, Battle of, 647.

Rodentia, or Rodents, 2434, 818, 2359, 2376.

Roderick, Last of the Visigoths, 1170.

Roderick the Great, of Wales, 3072.

Rodgers, John, 2434.

Rodin, Auguste, 2434, 2570. Roderick the Great, of Wales, 3012.
Rodgers, John, 2434.
Rodin, Auguste, 2434, 2570.
Rodman, Thomas Jefferson, 2434.
Rodney, Caesar, 2995.
Roe, Edward Payson, 2435, 89.
Roebling, John, 372, 2435.
Roebling, William Augustus, 2435.
Roebuck, or Roedeer, 2435, 771.
Röentgen, William Conrad, 2435, 1022, 3196.
Röentgen Rays, 2435, 3196.
Rogation Days, 2435, 979, 1601.
Roger II., of Sicily, 2628.
Rogers, Henry, 3245, 3251.
Rogers, Henry Wade, 2435.
Rogers, John, 2436.
Rogers, John, 2436.
Rogers, Randolph, 2436, 2570.
Rogers, Samuel, 2436.
Rogers, Woodes, 2583.
Rogue River, 468, 2049.
Rogues, or Low-Castes, 899. Rogues, or Low-Castes, 899.
Rohlfs, Anna Katherine Green, 2436.
Rohlfs, Friedrich Gerhard, 2436, 1114.
Rojestvensky, Sinovi Petrovich, 2436, 2473.
Roland, or Orlando, 2437, 535, 2439.
Roland, Jean Marie, 2437.
Roland, Marie Jeanne, 2437.
Rolfe, John, 2437, 2244.
Rolfe, William James, 2437.
Rolling Mill, 2437, 1410.
Roman Catholic Church, 2438; celibacy, 517; creed, 700; Dominicans, 815; fast, 979; festivals, 991; Franciscans, 1052; friars, 1071; Jesuits, 1452; mendicant orders, 1756; mission, 1806; Nicaean councils, 1969; nun, 2006; pontifical, 2270; pope, 2272; Reformation, 2388; rosary, 2449, 252; Sisters of Charity, 534; Ursulines, 3002; Vatican, 3023; Vatican Council, 3023. Rogues, or Low-Castes, 899. 534; Ursuines, 5002; varican, council, 3023.
Romance, 2438; Arthur, 156.
Romanic Language, 2439, 2445.
Romani, 1225, 2461.
Romanic People, 1047, 2323, 2696.
Romanoff, Michael, 1493. Romans, Epistle to the, 2439, 289, 2125. Romanticism, 2439. Roman Walls, 2439. Roman Walls, 2439.
Romblón, Philippines, 2187.
Rome, 2442; architecture, 133, 476; army, 150, 1563; Byzantium, 423; catacombs, 503; Christianity, 575, 2444; civil wars, 185, 429, 1709, 2268; colonies, 628; drama, 825; literature, 2445; plebeians, 2237; Sabines, 2480; sculpture, 2569; slavery, 2650; taxes, 2826; wars against Jugurtha, 1476; Pyrrhus, 2341; sculpture, 2569; Syria, 2802; Vandals, 3017.

Rome, Ga., 2440, 1121.
Rome, Italy, 2440, 1611; Appian way, 120; aqueducts, 123; Capitoline Hill, 476; carnival, 486; circus, 586; Colosseum, 633; festivals, 991; forum, 1039; gladiator, 1146; Pantheon, 2097; theater, 2856; tribunes, 2918.
Rome, N. Y., 2440, 1958.
Romeo and Juliet, 2603.
Römer, Olaus, 713, 1480.
Romilly, Sir Samuel, 2771.
Romney, George, 2446. Romily, Sir Samuel, 2771.

Romney, George, 2446.

Romulus, 2446, 586, 2440, 2442.

Roof, 2446, 489, 2879, 2649, 2817.

Rook, 2446, 714.

Roon, Albrecht Theodor, 2446.

Roosevelt, Theodore, 2447, 89, 2976, 3236, 3247.

Root (botany), 2448, 347, 2233, 2579.

Root, Elihu, 2448, 486.

Root, George Frederick, 2448. Root, George Frederick, 2448. Rootlets, 347, 1132, 2233. Rope, 2448, 477, 2377. Rorqual, 2449, 3131. Rosa, Salvator, 2449. Rosaceae, 2449, 2450. Rosamond, 2449; Henry II., 1286. Rosamond, 2449; Henry II., 1286.
Rosario, Argentina, 2449, 138.
Rosary, 2449, 252, 396.
Roscius, Quintus, 2450.
Roscoe, William, 1139.
Rose, 2450, 181, 1021, 2158.
Rose Acacia, 2450; acacia, 11.
Rosebery, Archibald Philip, 2450.
Rosecrans, William Starke, 2450, 557, 676, 950.
Rosemary, 2451, 1021, 2158.
Rosekranz, Johann Karl, 2451, 875, 2554. Rosekranz, Johann Karl, 2451, 875, 2554. Rosenmüller, Ernst Friedrich, 1468. Roses, Attar of, 181, 2158. Roses, Wars of the, 2451, 877, 3208. Rosetta Stone, 2451, 884, 1299. Rosetta Stone, 2451, 884, 1299.
Rosewood, 2451, 3027.
Rosicrucians, 2452.
Rosin, 2452, 3022, 3051.
Ross, Alexander Milton, 2452.
Ross, Sir James Clark, 2452, 931, 2251.
Ross, Sir John, 2452, 339.
Rossa O'Donovan, 986.
Rossetti, Christina Georgina, 2452.
Rossetti, Christina Georgina, 2452.
Rossetti, Gabriele, 2453, 1422.
Rossetti, William Mitchel, 2452.
Rossetti, William Mitchel, 2452.
Rossi, Countess. See Sontag, Henriette, 2676. Rossi, Countess. See Sontag, Henriette, 2676. Rossi, Countess. See Sontag, Henrie Rossini, Gioachino Antonio, 2453. Rossiter, Thomas Prichard, 2453. Rossland, British Columbia, 2453, 377. Rostock, Germany, 2453, 317. Rot, 2453; fungi, 1078. Rotation of Crops, 2453, 38. Rötheln, or German Measles, 1744. Rothschild Family, 2454, 1054. Rotterdam, Netherlands, 2454, 1927. Roubaix, France, 2454. Roubaix, France, 2454, 268, 1047, 1459. Rouge, 2455, 2484. Rouge-et-Noir, 2455. Rough and Ready, 2829. Roughriders, 2455, 696, 2447. Roulette, 2455; gambling, 1093. Roumania, or Rumania, 2460. Roumelia, or Rumelia, 2462. Rounders, 2455. Roundheads, 2455, 512, 870. Round Table, 2455, 157, 1176.

Rousseau, Jean Baptiste, 2455. Rousseau, Jean Jacques, 2456, 875, 1048. Rousseau, Lovell Harrison, 2456. Rousseau, Pierre Étienne, 2457. Rowan, Stephen Clegg, 2457. Rowan Tree. See Mountain Ash, 1862. Rowe, Nicholas, 1548. Rowe, Nicholas, 1548.
Rowing, 2457; yachting, 3198.
Rowland, Henry Augustus, 2457.
Royal Arcanum, 274.
Royal Gorge, 2457.
Royal Institution of Great Britain, 2458.
Royal Society, The, 2458, 762, 1954.
Royal Society of Canada, 2458.
Roycroft Shop, 859, 1331.
Rubber, 1383; rubber stamps, 2738. Roycroft Shop, 859, 1331.
Rubber, 1383; rubber stamps, 2738.
Rubens, Peter Paul, 2458, 923, 2081.
Rubicon River, 2459, 430, 2422.
Rubidium, 2459, 547, 1766.
Rubinstein, Anton, 2459, 1879.
Ruble, 2459, 1826.
Ruby, 2459, 2750.
Rudagi, 2165.
Rudder, 2459; ship, 2616.
Rude. François, 2459. Rudder, 2459; ship, 2616. Rude, François, 2459. Rudolph of Hapsburg, 195, 1250. Rudolphi, Karl Asmund, 925. Ruff, or Reeve, 2460, 2517. Rugby, England, 2460, 153, 1333. Rügen, Island, 2460. Rugs, 490; jute, 1481. Ruhmkorff, Heinrich D., 1385. Rule of Three, 2320. Rum, 2460, 3126. Rum, 2460, 3126. Rumania, or Roumania, 2460, 215, 282, 2944. Rumelia, or Roumelia, 2462, 282, 400, 2944. Ruminants, 2462, 446, 1143, 2607. Rump Parliament, 2462, 1626. Rumsey, James, 2732. Runeberg, Johan Ludwig, 2462. Runes, 2463; runic manuscripts, 2463. Runjit Singh, 2463, 794. Runners (cursores), 298. Runners (in strawberries), 2759. Runnymede, or Runnimede, 2463, 1674. Runyon, Theodore, 2463. Runyon, Theodore, 2463. Rupee, 2463, 1527. Runyon, Theodore, 2463.
Rupee, 2463, 1527.
Rupert, Prince, 2463, 309, 377, 869, 1717, 2478.
Rupert's Land, 2464, 1332.
Rupture (hernia), 1293.
Rurik, of Russia, 2004, 2470.
Rush, 2464; bulrush, 404.
Rush, Benjamin, 2464, 2995.
Rusk, Jeremiah McLain, 2464, 2993.
Ruskin, John, 2464, 920, 2303, 3241, 3252.
Russell, Sir Charles Arthur, 2465.
Russell, John, Earl, 2465.
Russell, John Scott, 2465.
Russell, Sol Smith, 2465.
Russell, William, Lord, 2465, 2478.
Russell, William Clark, 2466.
Russell, William Eustis, 2466.
Russell, William Howard, 2466.
Russia, 2466, 950; Armenia, 147; bell, 268; Crimea, 705, 2471; debt, 767, 1902; exiles, 2626; Finland, 999; flag, 1009; Khiva, 1505; language, 1540, 2470; literature, 2470; Lithuania, 1607; Nova Zembla, 2003; Poland, 2247; Servia, 2592; Siberia, 2625; Slavs, 2651; Tartars, 2822, 2469; Turkestan, 2938.
Russian Bath, 246.
Russian Revolution, 2472. Russian Thistle, 2473.
Russo-Japanese War, 2473, 951.
Russo-Turkestan, or Russian Turkestan, 2476.
Russo-Turkish War, 2476.
Rust, 2477; fungi, 1078.
Rust (metals), 2477, 662.
Ruta-baga, 2945.
Rutgers College, 1936, 1945.
Ruth, Book of, 2477, 289.
Ruthenians, or Russniaks, 2477, 1086.
Rutheniam (chemistry), 547, 2234.
Rutherford, N. J., 2477.
Rutherford, Daniel, 546.
Rutland, Vt., 2477, 3034.
Rutledge, Edward, 2477, 2995.
Rutledge, John, 2477, 2989.
Ruysdael, Jacob, 2477.
Ruyter, Michael Andriaenszoon, 2478.
Ryan, Patrick John, 2478.
Rydberg, Victor, 2787.
Rye, 2478, 1176, 2009, 3138.
Rye-House Plot, 2478, 536, 2466.
Ryswick, or Rijswijk, Holland, 2478; Peace of, 2478.

S

S, 2479, 424, 2951.
Saadi, Shaikh Muslih-uddin, 2165.
Saale River, 2479, 994.
Saar River, 2479, 3064.
Saarbrücken, Germany, 2479.
Sabbath, 2479, 1311, 3116.
Saber, 2796; arms, 149.
Sabine Pass, 2479, 2851.
Sabine River, 2479, 2851.
Sabine River, 2479, 2851.
Sabines, or Sabini, 2480, 2442, 2446.
Sable, 2480, 1079, 1717.
Sable Island, 2480, 457.
Sac, or Sauk. See Sacs and Foxes, 2482.
Saccharin, or Saccharine, 2480, 117.
Sachs, Hans, 2480, 1129, 1799.
Sackett's Harbor, N. Y., 2480.
Sackville, Thomas, 2480.
Sackville, Thomas, 2480.
Saco, Me., 2480.
Saco River, 2480, 1679.
Sacrament, 2481; baptism, 228.
Sacramento, Cal., 2481, 2978.
Sacramento, Cal., 2481, 438, 2521.
Sacrad Beetles, 263, 2546.
Sacrifice, 2481, 413.
Sacs and Foxes, 2482, 305.
Saddleback Mountain, 1679.
Saddlery, 2482, 1254.
Saddleback Mountain, 1679.
Saddlery, 2482, 1254.
Sadducees, 2482, 1456, 2179.
Sadi, or Saadi, 2482, 2165.
Sadowa, Bohemia, 2483, 196, 573, 1423, 1518.
Safe, 2483; safe-deposit companies, 2483.
Safety Bicycle, 290.
Safety Lamp, 2493, 762, 1002.
Safety Matches, 1734.
Safety Valve, 2484, 325.
Safflower, 2484, 155, 621; crocus, 709.
Saga, 2484, 783, 1358, 1999, 2546.
Sagard, Gabriel, 456.
Sagard, Gabriel, 456.
Sagard, Russell, 2485.
Sage, Russell, 2485.
Sage Brush State, 1929.

Sage Grouse, or Sage Hen, 2485, 1209. Saghalien, or Sakhalin, Island, 2485, 2476. Saginaw, Mich., 2485, 1780. Saginaw Bay, 2486, 1343, 1778. Saginaw River, 1343, 1778, 2486. Sagittarius, 2486, 3223. Sago, 2486, 2089. Saguenay River, 2486, 2348. Saguntum, or Saguntus, Spain, 2486. Sahara, 2486, 31, 2369, 2880. Said Pasha, 884. Saigon, French Cochin China, 2487, 94. Sail, 2487, 320, 2616. Saint Albans, England, 2488. Sail, 2487, 320, 2616.
Saint Albans, England, 2488.
Saint Albans, Vt., 2488, 3034.
Saint Aldegonde, Lord. See Marnix, 1713.
Saint Andrews, Scotland, 2488, 2563.
Saint Anthony Falls, 1798, 1807.
Saint Augustine, Fla., 2488, 1756.
Saint Bartholomew, Island, 1562.
Saint Bartholomew Massacre, 507, 1334.
Saint Bavon, Cathedral of, 1227.
Saint Bernard Dog, 2488, 811.
Saint Bernard Pass, 2488, 1248, 1895.
Saint Beuve, Madeline, 3002.
Saint Catherines, Ontario, 2489, 2040. Saint Catherines, Ontario, 2489, 2040. Saint Catherine's Academy, 1579.
Saint Catherine's School, 184.
Saint Charles, Mo., 2489, 1813.
Saint Christopher. See Christopher, Saint, 576.
Saint Clair, Gen. Arthur, 583, 1608, 1776.
Saint Clair Canal, 1779.
Saint Clair Lake, 2489, 1778.
Saint Clair River, 2489, 2494.
Saint Clair Tunnel, 2489, 2280, 2936.
Saint Cloud, France, 2489.
Saint Cloud, Minn., 2489, 1802.
Saint Croix River, 2489, 1679.
Saint Croix River, Wis., 2489, 3167.
Saint-Cyr, Laurent Gouvain, 2489.
Saint Cyr, France, 2489.
Saint Denis, France, 2489. Saint Denis, France, 2489. Sainte-Beuve, Charles Augustin, 2490, 277. Saint Elias, Mount, 2490, 2434. Saint Elias, Mount, 2490, 2434.
Saint Ephraem, 2802.
Saint Étienne, France, 2490, 1047.
Saint-Évremond, Seigneur de, 2490, 1048.
Saint Francis, Lake, 2490.
Saint Francis River, 2490, 1811.
Saint Francis River, Canada, 2490.
Saint Gall, Switzerland, 2490, 2795.
Saint Gaudens, Augustus, 2491, 2570. Saint Gaudens, Augustus, 2491, 2570. Saint Gaudens, Augustus, 2491, 2570.
Saint Géneviève, Church of, 2097.
Saint George's Channel, 2491, 1186, 1405.
Saint Germain, France, 2491.
Saint Gothard. See GOTHARD, SAINT, 1169.
Saint Gothard Tunnel, 76, 1169, 2935.
Saint Helena, Island, 2491, 127, 1876.
Saint Helens, England, 2491.
Saint Helen's, Mount, 496.
Saint-Hilaire, Geoffrey, 1048.
Saint Hyacinthe, Ouebec, 2491, 2350. Saint-Hilaire, Geoffrey, 1048.
Saint Hyacinthe, Quebec, 2491, 2350.
Saint Ignatius' Beans, 2762.
Saint Ignatius College, 2491.
Saint James's Palace, 1622; Court of, 250.
Saint John, New Brunswick, 2492, 1935.
Saint John, Island, 750.
Saint John, John Pierce, 2492, 2319.
Saint John River, 2492, 1679.
Saint John of Jerusalem, Knights of, 2492, 2409. 2409.

Saint John's, Newfoundland, 2493, 1939.
Saint Johns, Porto Rico, 2522.
Saint John's Bread, 487.
Saint Johns River, 2493, 1016.
Saint Johnsbury, Vt., 2493.
Saint Joseph, Mich., 2493.
Saint Joseph, Mo., 2493, 2975.
Saint Just, Antoine Louis de, 2494 Saint-Just, Antoine Louis de, 2494. Saint Kitts, 576, 1562. Saint Kitts, 576, 1562.
Saint Lawrence, Gulf of, 2494, 2348.
Saint Lawrence River, 2494, 1533, 1987.
Saint Leger, Barry, 2495, 2054.
Saint Louis, Mo., 2495; Eads's Bridge, 372; exposition, 960, 1637; library, 1584; population, 2496; Washington University, 2997.
Saint Louis, West Africa, 2496.
Saint Louis, University of, 2497.
Saint Louis Tunnel, 2936.
Saint Lucia, Island, 2497, 3161.
Saint Luke's Hospital. 1866. Saint Luke's Hospital, 1866. Saint Mark, Cathedral of, 2497. Saint Mark, Cathedral of, 2497.
Saint Martin's Cathedral, Lucca, 1642.
Saint Mary's, Ohio, 2497.
Saint Mary's Island, 2559.
Saint Mary's River, 2497, 2537.
Saint Mary's Ship Canal, 459, 1779, 2537.
Saint Maryica River, 2407, 1348. Saint Mary's Ship Canal, 459, 1779, 2537.
Saint Maurice River, 2497, 1348.
Saint Michael's Church, 691.
Saint Patrick, Knights of, 1515.
Saint Patrick's College, 1741.
Saint Paul, Minn., 2497, 1798, 2978.
Saint Paul de Loanda. See Loanda, 1612.
Saint Paul's Cathedral, 814, 1622, 3186.
Saint Peter, Minn., 2498.
Saint Petersburg, Russia, 2498; Kronstadt, 1522; library, 1584; Peter the Great, 2172; university, 2997; Winter Palace, 2499.
Saint Peter's Cathedral, 814, 1570, 2441.
Saint Peter's Church. See Peter's, Saint, 2174. Saint Peter's Church. See Peter's, 2174.
Saint Pierre, Island, 2499, 1804.
Saint-Pierre, Jacques Henri, 2500.
Saint Pierre, Martinique, 1719.
Saint Quentin, France, 2500, 881.
Saint Roch, Quebec, 2347.
Saint-Saéns, Charles Camille, 2500.
Saint-Simon, Claude Henri, 2500.
Saint-Simon, Louis de Rouvroy, 2500.
Saint-Simon, Louis de Rouvroy, 2500.
Saint Sophia, 2576.
Saint Thomas, Island, 2501, 1215.
Saint Thomas, Ontario, 2501.
Saint Thomas, West Indies, 2501, 750.
Saint Valentine's Day, 3011.
Saint-Victor, Paul Bins de, 1048.
Saint Vincent, Cape, 2501. Saint-Victor, Paul Bins de, 1048.
Saint-Victor, Paul Bins de, 1048.
Saint Vincent, Cape, 2501.
Saint Vincent, Island, 2501, 3161.
Saint Vincent's College, 1629.
Saint Vincent's Gulf, 21, 2685.
Saint Vitus's Dance, or Chorea, 2501.
Saint Wapniac, 425.
Sais, Egypt, 2501.
Saki, 2501.
Salai, George Augustus, 2501.
Saladin, 2502, 717, 1452.
Salado River, 2502, 137.
Salamanca, N. Y., 2502.
Salamanca, N. Y., 2502.
Salamander, 2502, 92, 2922.
Salamander, 2502, 92, 2922.
Salamis, or Kuluri, Island, 2503, 176, 2673.
Salamis, Battle of, 2503, 2858, 3195.

Sal Ammoniac, 2503; ammonia, 90.
Salayer Islands, 2503.
Salem, India, 2504.
Salem, Mass., 2503, 1729, 3171.
Salem, N. J., 2503.
Salem, Ohio, 2503.
Salem, Ohio, 2503.
Salem, Or., 2503, 2051, 2978.
Salerno, Italy, 2504.
Salford, England. See Manchester, 1690.
Salic Law, 2504, 2351, 2698.
Salicylic Acid, 2504, 610, 2507.
Salina, Kans., 2504.
Salisbury, or New Sarum, England, 2504.
Salisbury, N. C., 2504.
Salisbury, John of, 2553.
Salisbury, Robert Arthur, 2505, 1148.
Saliva, 2505, 1732, 2208.
Salivary Glands, 1869, 2505.
Sallee, or Sla, Morocco, 2505.
Sall Mountain, Ga., 160.
Sallust, Caius, 2505, 2445.
Salmon, 2505, 1006, 2655, 2924.
Salmon Trout. See Trout, 2924.
Salon, 2507; salicylic acid, 2504.
Salon, 2507, 333, 1751, 2434.
Salonica, or Saloniki, 2507, 2943.
Salonica, Gulf of, 2507, 2940.
Salt, 2507, 1979, 2670.
Salt, or Chloride of Sodium, 2507, 1635, 2486; salt lakes, 498, 764, 1191, 3004; sea, 2571.
Salta, Argentina, 138.
Saltillo, Mexico, 2508.
Salt Lake State, 3004.
Salt Lake State, 3004.
Salt River, Ariz., 745. Sal Ammoniac, 2503; ammonia, 90. Salayer Islands, 2503. Salton Sea, 2009. Saltpeter, or Nitre, 2509, 560. Salt River, Ariz., 745. Salts, 2509; Epsom, 929; Glauber's, 1150. Saltus, Egar Evertson, 2509. Saltus, Egar Evertson, 2009.
Saltzmann, Karl, 2509.
Salvador, Republic of, 2509, 521.
Salvation Army, 2510, 338, 2812.
Salvini, Alexander, 2511.
Salvini, Tommaso, 2511. Salvini, Tommaso, 2511.
Salwin, or Salween, River, 2511, 1736.
Salzburg, Austria-Hungary, 2511, 1864.
Salzburg, Province of, 195, 2511.
Sámar, Island, 2511, 2187.
Samaraa, Russia, 2511.
Samarang, Java, 2511, 1445.
Samaria, Palestine, 2511, 1456, 2084.
Samaritans. See Samaria, 2511.
Samarkand, or Samarcand, Turkestan, 2512, 2039. 2939. Sāma-Veda, 3024. Sambo Deer, 771.
Sammonicus, Severus, 8.
Samnites, 2512, 942, 2958.
Samoan Islands, or Navigators' Islands, 2512, 2264.
Samos, Island, 2513, 2295, 2940.
Samothrace, or Thracian Samos, Island, 2513.
Samoyeds, or Samoyedes, 2987.
Sampson, William T., 2513, 2551, 2982.
Sam Slick, 1236, 2327.
Samsö, Island, 511, 781.
Samson, 2513, 1456, 1912, 2417.
Samuel, 2513, 1456, 2536.
Samuel, Books of, 289, 2514.
San Antonio, Tex., 2514, 2853.
Sanarelli, J., 3204.
San Bernardino, Cal., 2514.

San Bernardino, Mount, 610. San Bernardino, Mount, 610.
Sanborn, Franklin Benjamin, 2514, 384.
Sancho II., 581.
San Cristóbal, Mexico, 2514.
Sanctification, 1481, 2157; penance, 2145.
Sand, 2515; clay, 596; glass, 1149; gravel, 1183; loam, 1612; quicksands, 2354; sandstone, 2517; soil, 2671.
Sand, George, 2515, 1048, 2327, 3256.
Sandal, 830, 2619.
Sandalwood, 2515, 2158.
Sand Blast, 2515, 8, 1150.
Sand Bur, 2515; burgrass, 2515.
Sand Creek Village, Attack on, 551.
Sandeau, Jules, 996.
Sanderling, 2515; snipe, 2664.
Sanderson, Robert, 3079.
Sandhill Crane, 696.
Sandhurst, or Bendigo, Australia, 2516, 3045.
San Diego, Cal., 2516, 2318.
San Diego, Cal., 2516, 2966.
San Domingo, or Santo Domingo, 2516.
San Domingo, or Dominican Republic, 2516, 1271, 2904. Sanborn, Franklin Benjamin, 2514, 384. 1271, 2904.
Sandpaper, 2517, 8; emery, 911.
Sandpiper, 2517, 2460.
Sandstone, 2517, 1115.
Sandusky, Ohio, 2518, 933.
Sandusky Bay, 2518.
Sandusky River, 2022, 2518.
Sandwich Islands. See HAWAHAN ISLANDS, 1271, 2904. 1265.
Sandy Hill, N. Y., 2518.
Sandy Hook, 2518, 1944.
Sandys, Sir Edwin, 2518.
Sandys, George, 84.
San Francisco, Cal., 2518, 440, 2974.
San Francisco See São Francisco, 2527.
San Francisco Bay, 437, 2518.
San Germán, Porto Rico, 2520, 2284.
Sangir Islands, 2520.
Sangster Charles 456 Sangster, Charles, 456. Sanguinaria, 315. Sanhedrim, 2520, 1456. Sanguinaria, 315.
Sanhedrim, 2520, 1456.
Sanitary Commission, 2521.
Sanitary Science, 2520; hygiene, 1351.
Sanitary Science, 2520; hygiene, 1351.
Sanitation, 572, 1095.
San Jacinto, Battle of, 2521, 2853.
Sanjaks, or Provinces, 2942.
San Joaquin River, 2521, 438, 2481.
San José, Cal., 2521, 440, 1585.
San José, Costa Rica, 2521, 685.
San Juan, Porto Rico, 2522, 2284.
San Juan Hill, Battle of, 246, 2455.
San Juan Hill, Battle of, 246, 2455.
San Juan River, 2522, 1970; in Utah, 602.
Sankey, Ira David, 2522, 1842.
San Luis Potosi, Mexico, 2522, 1775.
San Marino, 2522, 2399.
San Martin, José de, 2522.
San Micheli, Michele, 2523.
San Pablo Bay, 2518.
San Salvador, Salvador, 2523, 1426.
San Salvador, Island, 210, 3126.
Sans-Culotte, 2523.
Sanskrit, 2523, 159, 1377, 1740; Pali, 20 Sans-Culotte, 2523.
Sanskrit, 2528, 159, 1377, 1740; Pali, 2085; Vedas, 3024. Santa Ana, Salvador, 2524, 2510. Santa Anna, Antonio, 2524, 396, 523, 1328 1775, 2829. Santa Anna, Island, 127. Santa Barbara, Cal., 2525.

Santa Claus, 2525, 1972.
Santa Cruz, Bolivia, 2525, 328.
Santa Cruz, Cal., 2525.
Santa Cruz, Canary Islands, 2525, 460.
Santa Fé, Argentina, 2525.
Santa Fé, New Mexico, 2525, 1948, 2979.
Santa Maura. See Leucadia, 1576.
Santander, Spain, 2526.
Santa Rosa, Cal., 2526, 440.
Santiago, Chile, 2526, 560, 2997.
Santiago, Battle of, 2526, 722, 2982.
Santiago, Battle of, 2526, 722, 2982.
Santiago, Island, 473.
Santiago de Cuba, 2526, 524, 720, 2982.
Santo, Caserio, assassin, 487.
Santo Domingo, See San Domingo, 2516.
Santo Monte, or Holy Mountain, 177.
Santos, Brazil, 2526, 364.
Santos-Dumont, Albert, 2527, 1024, 1591.
São Francisco River, 2527, 362.
Saône River, 2527, 1045, 2410.
Sao Paulo, Brazil, 2527, 364.
Sap, 2527; sap flow, 585, 1325.
Sapan Wood, 364.
Sapajou, or Sajou, 2527.
Sapphire, 2527, 684, 1108, 2750.
Sappho, 2527, 1574, 2018, 2771.
Sap Pressure, 347.
Saprophytic Bacilli, 207.
Saracen, 2528, 423, 717; invasion of France, 538; gunpowder, 1221; Moors, 133, 1844, 2697.
Saragossa, Spain, 2528; maid of, 2528.
Sarat, 8, 1415, 1416, 1825.
Saratoga, Battle of, 2528, 248, 1103.
Saratoga Springs, N. Y., 2529; Lake Saratoga, 2529.
Saratova, or Saratoff, Russia, 2529, 3061. Saratov, or Saratoff, Russia, 2529, 3061. Sarawak, Borneo, 342, 848. Sarcolemma, 1876. Sarcolemma, 1870.
Sarcoma (cancer), 461.
Sarcophagus, 2529, 619, 2893.
Sard, 2529; chalcedony, 526, 2530.
Sardanapalus, 2529.
Sardine, 2529, 2715; fish, 1004.
Sardinia, Island, 2529, 1423.
Sardinia, Kingdom of, 2530, 3042.
Sardinia or Sardes Lydia 2529, 1644 Sardinia, Island, 2529, 1423.
Sardinia, Kingdom of, 2530, 3042.
Sardis, or Sardes, Lydia, 2529, 1649.
Sardonyx, 2530, 2750.
Sardou, Victorien, 2530, 1048.
Sargasso Sea, 728, 1218.
Sargent, Epes, 2531, 826.
Sargent, John Singer, 2531.
Sargon, 2531, 171, 2587.
Sark, Island, 532.
Sarmatians, 2531; Sarmatia, 2531.
Sarnia, Ontario, 2531.
Sarnia, Ontario, 2531.
Sarnia, River, 2267.
Sarpedon, 2531, 946.
Sarpi, Paoli, 2327.
Sarsaparilla, 2531, 2708.
Sart, Asia Minor, 2530.
Sarto, Andrea del, 2532.
Saskatchewan, Canada, 2534.
Saskaton, Saskatchewan, 2534.
Sassari, Sardinia, 2530.
Satan. See Devil., 790, 981.
Satellite, 2534, 854, 1842, 2671.
Satin, 2535; silk, 2635.
Satine, 2535, 1482.
Satolli, Francisco, 2535.

Saturday, 2535, 3116.
Saturn (cronus), 2535, 3219, 1028.
Saturn, 2535, 173, 2534, 2672.
Saturnalia, 2536, 991.
Satyavarta, Prince, 779.
Satyrs, 2536; fairies, 969.
Sauerkraut, 2536, 424.
Saul, 2536, 759, 1456, 2514.
Saugus, Mass., 2537.
Sault Sainte Marie, Mich., 2537, 1780.
Sault Sainte Marie, Ontario, 2537.
Sault Sainte Marie, Contario, 2537.
Sault Sainte Marie, Ontario, 2537.
Saunders, Richard, 74; almanac, 85, 1056.
Saunders, William, 977.
Saury Pike, 2537; skipper, 2537.
Sausage, 2537, 1745.
Saussure, Horace Bénédict, 733.
Savage, Richard, 2537.
Savage's Station, Battle of, 557.
Savagi, Island, 2512.
Savannah, Ga., 2538, 2614.
Savannah River, 2538, 1119.
Save River, 2538, 193.
Savery, Captain Thomas, 2734.
Savings Bank, 2538, 226.
Savonarola, Girolamo, 2539, 61, 1423. Savery, Captain Thomas, 2734.
Savings Bank, 2538, 226.
Savonarola, Girolamo, 2539, 61, 1423.
Savoy, Eugène of, 944, 1711.
Savoy, House of, 2540, 2530, 2628.
Saw, 2540, 489.
Sawfish, 2541, 2379.
Sawfish, 2541.
Sawmill, 2541; forest, 1031.
Sawwill, 2541; forest, 1031.
Sawyer, Thomas Jefferson, 2541.
Sax, Adolph, 2542.
Saxe, John Godfrey. 2541, 3252, 3255.
Saxe, Maurice, Marshal, 2542, 1027.
Saxe-Coburg-Gotha, Duchy of, 613.
Saxe-Weimar-Eisenach, 1448, 3118.
Saxhorn, 2542; horn, 1322. Saxe-Weimar-Eisenach, 1448, 3118.
Saxhorn, 2542; horn, 1322.
Saxifrage, 2542, 1348.
Saxons, 2542, 103, 535, 920, 1130, 1482, 2563.
Saxon Style of Writing, 3188.
Saxony, Kingdom of, 2542, 1130, 2325.
Saxophone, 2542.
Saxton, Joseph, 2543.
Sax Jean Bantiste Léon, 2543. Say, Jean Baptiste Léon, 2543. Say, Lord, 428. Say, Lord, 428.
Sayce, Archibald Henry, 2544.
Sayle, William, 539.
Sayre, Pa., 2544.
Scab, 2544; mange, 1693.
Scabbard Fish, 2544.
Scadding, Henry, 456.
Scale, 2544, 1, 202, 424, 1879.
Scale Insect, 2544; louse, 1638.
Scales, 968; steelyards, 213.
Scales, 968; steelyards, 213.
Scales, 2544, 1004, 2664.
Scallop, 2544; bivalves, 303.
Scalp, 2545, 3193; skull, 2648.
Scammony, 2545.
Scanderbeg, 2545.
Scandinavia, 2545; literature, Scandinavia, 2545; literature, 868, 2484, 783, 1999, 2787. 1999, 2787.
Scandinavian Peninsula, 948, 1997, 2785.
Scandinavians, 159, 782, 2787.
Scandium (chemistry), 547.
Scansores, 298.
Scapula, or Shoulder Blade, 2546, 2646.
Scar, or Hilum, 2579.
Scarabaeus, 2546; beetle, 263.
Scarfoglio, Signora. See Serao, Matilda, 2589.
Scarlatina, or Scarlet Fever, 2546.

Scarlatti, Alessandro, 2041. Scarlet Tanager, 2813. Scarron, Paul, 2546, 1681. Schaffon, Paul, 2546, 1061.
Schadow, Johan Gottfried, 2546.
Schaff, Philip, 2546, 3251.
Schaffhausen, Switzerland, 2547.
Schauffler, William Gottlieb, 2547.
Scheele, Carl Wilhelm, 2547, 2071, 2073. Scheffer, Ary, 2547. Scheldt River, 2548, 266, 1925. Scheldt River, 2548, 266, 1925.
Schelling, Frederick, 2548, 786, 1129, 1363.
Schenck, Robert Cumming, 2548.
Schenctady, N. Y., 2548, 1958.
Schiller, Johann, 2548, 826, 1129, 3118.
Schilling, Johann, 2549, 2570.
Schist, 2921. Schlegel, August Wilhelm, 2549, 435, 1130. Schlegel, Friedrich von, 2550, 798, 2554. Schleicher, August, 2550. Schleiermacher, Friedrich, 2550, 1130, 2377. Schleswig-Holstein, 2550, 783, 1052, 2595. Schley, Winfield Scott, 2551, 722, 2982. Schleyer, Johann Martin, 3060. Schlick, Otto, 1226. Schliemann, Heinrich, 2551, 1884, 2925. Schmalkalden, Germany, 2552.
Schmalkalden, League of, 2552, 1737.
Schmidt, Maximilian, 2552.
Schnitzer, Eduard. See EMIN PASHA, 912.
Schnorr von Carolsfeld, Julius, 2552. Schnorr von Carolsfeld, Julius, 2552.
Schofield, John McAllister, 2552, 1055.
Scholasticism, 2552, 2196.
Scholz, Wilhelm, 482.
Schönbein, Christian F., 1219.
Schöneberg, Germany, 2553.
Schoolcraft, Henry Rowe, 2553.
Schools, 2553; academy, 11; college, 623; education, 872; institute, 1394; kindergarten, 1507; normal school, 1984; university, 2996.
Schools of Correspondence, 2555. Schools of Correspondence, 2555. Schooner, 2555, 2616. Schooner, 2555, 2616.
Schopenhauer, Arthur, 2556, 1129, 2170.
Schottisch, 748, 3079.
Schottisch, 748, 3079.
Schouler, James, 2556, 1605.
Schubert, Franz Peter, 2556, 1130, 1879.
Schumann, Robert, 2556, 1130.
Schumann-Heink, Ernestine, 2557.
Schumann, Jacob Gould, 2557.
Schurz, Carl, 2557, 84, 88.
Schuyler, Fort, 3007.
Schuyler, Philip, 2558, 1103, 3021.
Schuylkill River, 2558, 2181.
Schwanke, P., 1130. Schwanke, P., 1130. Schwanthaler, Ludwig Michael, 2558. Schwartz, Berthold, 1221. Schwartz, Hans, 496. Schwarzwald, 305, 208. Schwarzwald, 305, 208.
Schwatka, Frederick, 2558.
Schweinfurth, Georg August, 2558, 1114, 1977.
Schwerin, Germany, 2558.
Schwyz, Switzerland, 2795, 2839.
Science, 2559; arithmetic, 141; biology, 296, 910; chemistry, 545; ethnology, 940; geography, 1112; geology, 1114; medicine, 1748; philosophy, 2195; physiology, 2206; psychology, 2327; zoölogy, 3225.
Scilly, Islands, 2559, 1538.
Scio, Island, 2559; Sciotes, 2559.
Sciopticon. See Magic Lantern, 1674.
Scioto River, 2559, 2022. Scioto River, 2559, 2022. Scipio, Publius Cornelius, 2560, 1248.

Scipio, Publius Cornelius, 2560, 494. Scissorsbill. See SKIMMER, 2647. Scone, Scotland, 2560. Scoresby, William, 2560, 135, 2248. Scoresby, William, 2500, 135, 2248. Scorpio, or Scorpius, 2560, 3223. Scorpion, 2560, 2707, 3100. Scorpion Fish, 2561. Scotch Pine, 2218. Scotch Terrier. See Terrier, 2848. Scotch Thistle, 2865. Scotiste, 2553. Scotists, 2553. Scotland, 2561, 921, 1186, 1405; Bannockburn, 227; bards, 230; Covenanters, 691; Hebrides, 1277; highlands, 2561; literature, 3, 412, 2563, 2565; lowlands, 2561; national emblem, 1020; Picts, 2210; reformation, 2389; universities, 2997. 2997.
Scots, 1407, 2210, 2563.
Scott, David, 2565.
Scott, Duncan Campbell, 2565.
Scott, George Gilbert, 55.
Scott, John, 887.
Scott, Sir Walter, 2565, 3, 920, 2563.
Scott, Winfield, 2566, 533, 2211, 3031.
Scratchers (racres), 298 Scratchers (rasores), 298. Screamer, 2567; horned screamer, 2567. Screw, 2567, 132, 1746. Screw Pine, or Pandanus, 2567. Screw Propeller, 2568, 932, 1103. Scribe, 2568, 964, 2179. Scriew Propeller, 2308, 932, 1103.

Scribe, 2568, 964, 2179.

Scribe, Augustin Eugène, 2568.

Script, 3188.

Scrofula, 2568, 119, 3117.

Scudder, Horace Elisha, 2568.

Sculpture, 2568, 101, 238, 383, 416, 517, 698, 816, 1012, 1136, 1200, 1326, 1512, 1541, 1743, 2086, 2181, 2299, 2302, 2377, 2422, 2436, 2549, 2742, 2807, 2867, 2869, 3050.

Scurvy, or Scorbutus, 2570.

Scutari, Asiatic Turkey, 2570, 1974.

Scylla and Charybdis, 2570, 2957.

Scythe, 2570, 39, 2382.

Scythians, 2571; Scythia, 1747.

Sea, or Ocean, 2571, 856; Arctic, 135; Antarctic, 110; Atlantic, 178; currents, 728; gulf stream, 1217; Indian, 1381; Japan, 1524; maelstrom. 1672; Pacific, 2076; sounding, 2676; tides, 2876; whirlpool, 3137.

Sea Anemone, 2572, 2232.

Sea Biscuits, 300.

Sea Cucumber, 2572, 864, 2917. Sea Cucumber, 2572, 864, 2917. Sea Cow, 1689.
Sea Eagle. See Eagle, 852.
Sea Elephant, 2573.
Sea Horse. See Hippocampus, 1303.
Sea Island Cotton, 687. Seal, 2573, 50, 2025, 3077. Sealed Orders, 2574. Sealed Wax, 2574, 3108. Sea Lion. See Seal., 2573. Sea Mews, 1218. Sea Mouse, 2574. Sea Otter, 2574, 2066. Search, Right of, 2574. Seas, Barnas, 2574. Sea Serpent, 2574. Seasickness, 2575, 3063. Season, 2575, 856. Sea Squirt, 2575. Seal, 2573, 50, 2025, 3077.

Seattle, Wash., 2575, 3095.
Sea Urchin, 2576, 2574; echinodermata, 864.
Seaweeds, 728; sea plants, 2572.
Sebastian, Don, 2576.
Sebastian, Saint, 2577.
Sebastopol, or Sevastopol, Russia, 2577, 705.
Sebert, King of the East Saxons, 3127.
Secondary Schools, 2577, 2382. Secord, Laura, 2577. Secretary Bird, 2577. Secretary of State, 425, 2991. Secretion, 2578, 2207. Secret Service, 2578, 2219, 2253. Secret Service, 2578, 2219, 2253. Sections of Land, 2782. Secular Games, 2578. Sedalia, Mo., 2578, 1813. Sedan, France, 2578, 1053, 1897, 3152. Sedatives, 2578, 15. Sedge, 2579, 2464. Sedgmoor, Battle of, 1829. Sedgwick, Catherine Maria, 2579. Sedgwick, John, 2579. Sedimentary, or Aqueous Rocks, 111. Sedimentary, or Aqueous Rocks, 1115. Seed, 2579, 347, 2232. Seed Dispersion, 672, 2579. Seedland. See Zealand, 3216. Seedless Apple, 121. Seeley, John Robert, 2580. Seguin, Edouard Onesimus, 2580. Seidl, Anton, 2580. Seidl, Anton, 2580.
Seidlitz Powders, 2580.
Seine River, 2580, 1045.
Seine River Canal System, 2105, 2455, 2580.
Seismograph, or Seismometer, 2581, 857.
Sejanus. See Tiberius, 2874.
Selene, 2581, 1645.
Selenium, 2581, 547.
Seleucia, Asia, 2581, 210, 2801.
Seleucia, Pieria, 2581.
Seleucia-on-the-Tigris, 2581.
Seleucidae, 2581.
Seleucus Nicator, 113, 2581.
Selim I., 2582, 2943.
Selim III., 2582.
Selinus, Sicily, 2582. Selim 111., 2582. Selinus, Sicily, 2582. Seljuks, or Seljooks, 2582, 2943. Selkirk, Alexander, 2583, 1474. Selkirk, Manitoba, 1696. Selkirk Mountains, 2583, 376. Selma, Ala., 2583, 47. Selous, Frederick Courteney, 2583. Selwas, 2583, 2683. Selwyn, Alfred Richard Cacil, 2593. Selwyn, Alfred Richard Cecil, 2583. Semyn, Affred Richard Cecil, 2 Semaphore, 2583. Sembrich, Marcella, 2584. Seminoles, 2584, 701. Seminole War, 1018, 1382, 1429. Semiramis, 2584, 203, 1247. Semiru Mountain, 1444. Semites, 2584, 1455.
Semitic Language, 1540, 2195, 2801.
Semitic People, 125, 2585.
Semliki River, 55. Semmes, Raphael, 2585, 47. Sempach, Switzerland, 2585, 2796, 3163. Senate, 2585, 653, 1370, 2076, 2985. Senators, Election of, 3280. Seneca, Lucius Annaeus, 2585, 874, 2445, 3239. Seneca Falls, N. Y., 2586. Seneca Lake, 2586, 1956. Seneca Oil, 2177.

Seneca River, 2586. Senecas, 2586, 1412. Senefelder, Alois, 1607. Senegal, Western Africa, 2586, 33, 2496. Senegambia, 2586, 2496. Senegambia, 2586, 1047. Seni Om Sed, 94. Seni Om Sed, 94.
Senlac, Battle of, 1263.
Senn, Nicholas, 2587.
Senna, 2587, 499.
Sennacherib, 2587, 171, 203, 1297, 1978.
Sensation, 2588, 1878, 2328, 2824, 2902.
Sensibility, 1793, 2328.
Sensitive Plant, 2588.
Sensory Nerves, 1923.
Sentence Method, 2381.
Seoul. Corea, 2588, 675. Sensory Nerves, 1925.
Sentence Method, 2381.
Seoul, Corea, 2588, 675.
Sepals, 443, 1020.
Separator, 418.
Sepia, 2588, 732.
Sepoy, 2588, 604, 2694.
Sepoy Rebellion, 777, 1643, 2588.
September, 2588, 1839, 2575.
Septimius Severus, Arch of, 2589, 134.
Septuagint, 2589, 287, 1194, 1456.
Sequoia, 2589, 2387.
Seraglio, 2589, 660.
Serao, Matilda, 2589.
Serapeum, 2589.
Serapeum, 2589.
Serapis, or Sarapis, 2589, 63, 1755.
Serf, 2590, 61, 2650.
Serfdom, 2590, 3049.
Serf's Inch, Saint, 1613.
Sergius, Grand Duke, 95. Sertdom, 2590, 3049.
Serf's Inch, Saint, 1613.
Sergius, Grand Duke, 95.
Serinagur, or Srinagar, India, 2590, 497.
Serous Membrane, 2590, 1754.
Serpent Charming, 2590; magic, 1674.
Serpentine, 2590, 1674, 2635.
Serpents. See Snakes, 2663.
Serpent Worship, or Ophiolatry, 2590.
Serpula, 2591.
Sertorius, 2268.
Serum Therapy, 2591, 114.
Serval, 2591; cat, 502.
Servant, 35, 1732, 1918.
Servetus, Michael, 2591, 443.
Servie, or Gladiatorial, War, 2443, 2701.
Servius Tullius, 2593, 519, 2821.
Sesame, 2594, 2025.
Sesostris, 2594, 150, 1702.
Seth, 17.
Set J. of Egypt, 2504 Sesostris, 2594, 100, 1102.
Seth, 17.
Seti I., of Egypt, 2594.
Seton, Ernest Thompson, 2594, 106.
Setter, 2594, 810.
Seven Days' Battles, 2148, 2374.
Seven Pines. See FAIR OAKS, 970.
Seven Sisters, 2237.
Seven Sleepers, 2594.
Seventh-Day Adventists, 24. Seven Sleepers, 2594.
Seventh-Day Adventists, 24.
Seven Weeks' War, 2595, 1131, 1823.
Seven Wise Men, 2595, 2673.
Seven Wonders of the World, 2595, 633, 1247.
Seven Years' War, 2595, 1059, 1131, 2635.
Severn River, 2595, 917.
Severus, Alexander, 2596, 1085, 2300, 3208.
Sevier, John, 2596, 1085, 2300, 3208.
Sevier, John, 2596, 2696, 1048, 1575.
Seville, Spain, 2596, 2696.
Sevres, France, 2597, 2296.
Sèvres Porcelain, 2296, 2597. Sèvres Porcelain, 2296, 2597.

Sewall, Arthur, 2597.
Sewall, Samuel, 85.
Seward, William Henry, 2597, 182, 1595.
Sewell, Anna, 1324.
Sewell, William, 3251.
Sewellel, 2598. Sewenge, 2598; Berlin System, 281. Sewing Machine, 2598, 1329, 1917. Sextant, 2599, 2343. Sexual, or Hermaphrodite Flower, 1020. Sexual, or Hermaphrodite Flower, 1020. Seychelles, Islands, 2599. Seymour, 2599; Lady Jane, 2600, 1287. Seymour, Ind., 2599. Seymour, Horatio, 2600, 1180. Seymour, Jane, 1287, 2600. Seymour, Sir John, 2600. Seymour, Sir John, 2600. Sforza, Francesco, 2600. Shad, 2600, 1005. Shaddock, 2600, 587. Shaddock, 2600, 587. Shadwell, Thomas, 1548. Shaeffer, Nathan C., 2601. Shafter, William Rufus, 2601, 722, 2982. Shaftesbury, Anthony, 2601, 1614, 3234. Shag, 2601; cormorant, 677. Shaftesbury, Anthony, 2601, 1614, 3234.
Shag, 2601; cormorant, 677.
Shagbark, 1298.
Shagreen, 2601; leather, 1556.
Shah Jehan, 2601, 777, 2809.
Shahjehanpore, India, 2602.
Shahrazad, 126.
Shakers, 2602, 1558.
Shakespeare, William, 2602, 919; birthplace, 2757; drama, 826; poetry, 2245; theater, 2856.
Shale, 2603, 596, 1115.
Shaler, Nathaniel Southgate, 2604.
Shalmaneser IL, 2604, 170, 2197. Shalmaneser II., 2604, 170, 2197. Shalmaneser IV., 2604, 2511. Shamanism, 2604. Shamois, or Shamoy, 1556. Shamokin, Pa., 2604. Shamokin, Pa.. 2604.
Shamoying, 1556.
Shamrock, 2604, 2915; Indian, 3070.
Shamyl, or Schamyl. Samuel, 2604, 2889.
Shanghai, China, 2604, 567.
Shannon River, 2605, 1405.
Shans, or Laos, 2605, 1542.
Shari River, 2605, 342, 2930.
Shark, 2605, 2025.
Sharon, Pa., 2606.
Sharon, Plains of, 2084.
Sharpsburg, Pa., 2606.
Shasta, Mount, 2606, 438, 2631.
Shat-el-Arab, 945, 2878.
Shaw, George Bernard, 2606. Shat-el-Arab, 945, 2878.
Shaw, George Bernard, 2606.
Shaw, Henry Wheeler, 2606, 89, 2327.
Shaw, Leslie Mortier, 2606.
Shawl, 2606, 497.
Shawnee, Okl., 2607, 2028.
Shawnees, 2607, 68.
Shays, Daniel, 2607.
Shays' Rebellion, 1595, 2607.
Shaaffe, Sir Roger, Hale, 2607. Sheaffe, Sir Roger Hale, 2607.
Shearbill, 2647.
Shears, 2607; scissors, 2607.
Shear Steel, 2736.
Shearwater, or Hagden, 2607; petrel, 2176. Sheba, Queen of, 10, 940. Sheboygan, Wis., 2607, 3169. Shechem, 1577. Shekinah, 2803. Sheep, 2607, 497, 1029, 1693, 3180. Sheepshead, 2608.

Sheepskin, 1556, 2608. Sheeptick, 2608; tick, 2875. Sheffield, England, 2608, 918. Sheik, 2609, 258. Shekel, 2609. Shelby, Isaac, 2609. Shelby, Isaac, 2609.
Shelbyville, Ind., 2609.
Sheldon, Charles Monroe, 2609, 88.
Sheldon, Edward Austin, 2609.
Sheldrake, 2609, 1761.
Shell, 2610; mollusca, 1821; pearl, 2133.
Shell, 2610; cannon, 463; gun, 1218.
Shelley, Percy Bysshe, 2610, 826, 920.
Shell-lac. See Lac, 1527.
Shenandoah, Pa., 2611, 2151.
Shenandoah River, 2611, 3054.
Shenandoah Valley, 591, 2611.
Sheol, 2611, 1281. Sheol, 2611, 1281. Shepherd, Alexander, 805. Shepherd Dog, 2611, 811. Shepherd Dog, 2011, 811.
Shepherd's Purse, 2611.
Sherbrooke, Quebec, 2611, 2350.
Shere Ali, 2611, 5.
Sheridan, Wyo., 2611, 3193.
Sheridan, Philip Henry, 2612, 515, 3159.
Sheridan, Richard Brinsley Butler, 2612, 920. Sheriff, 2612, 2254. Sherlock Holmes, 822. Sherman, Tex., 2613, 2853. Sherman, Tex., 2613, 2853.
Sherman, James Schoolcraft, 2613, 2976, 3280.
Sherman, John, 2613, 763.
Sherman, Roger, 2613, 2989, 2995.
Sherman, William Tecumseh, 2613, 557, 1121, 1180, 1466, 3042.
Sherry. See Wine, 3162.
Sherwood, William Hall, 2614.
Sherwood Forest, 2614, 1318.
She Stoops to Conquer, 1162.
Shetland Islands, 2614.
Shetland Ponies, 1324, 2615.
Shiawassee River, 2486. Shiawassee River, 2486. Shibboleth, 2615. Shibboleth, 2015.
Shields, South, England, 2615.
Shiites, 2615, 69, 1763, 1819.
Shillaber, Benjamin Penhallow, 2615.
Shilling, 2615, 2298.
Shiloh, Battle of, 2615, 707, 2614.
Shiloh, Palestine, 2615, 901. Shiloh, Palestine, 2615, 901.
Shimonoseki, Treaty of, 1040.
Shimg-King, China, 2278.
Shingles, 489, 2446, 2649.
Shintoism, 2615, 1440, 2394.
Ship, 2616; boat, 320; galley, 1088; Monitor, 1827; navigation, 1909; navy, 1910; privateer, 2316; ram, 2371; sail, 2487; steamboat, 2732; trireme, 2921; yacht, 3198.
Ship Canals, 459; Suez, 2768; Welland, 3119.
Ship Railway, 2617.
Shipton, Mother, 2618.
Shipworm, or Teredo, 2618. Shipworm, or Teredo, 2618. Shipworm, or Teredo, 2618.
Shiras, George, 2618.
Shiras, Persia, 2618, 2164.
Shire River, 2618, 3215.
Shirley, James, 3254.
Shirley (John Skelton), 2327, 2646.
Shishak, 2618, 1456.
Shittim, 2618.
Shoddy, 2364.
Shoes, 2619, 339, 1384, 1556.
Shogun, or Tycoon, 2619.
Shonts, Theodore Perry, 2619.
Shooting, 2620, 2818; rifle, 2420.

Shooting Stars, 1767. Shorthand, or Phonography, 2620, 2224, 3188. Shorthand, or Phonography, 2620, 2224, 31 Short Parliament, 536. Shoshone Falls, 2620, 2663. Shoshone Mountains, 2434, 3191. Shoshone River. See SNAKE RIVER, 2663. Shoshones, or Snakes, 2620. Shot, 2621; bullet, 402, 2420. Shotgun, 2621; gun, 1218. Shoveler, or Spoonbill, 2621. Show, 234, 617. Showers of Fishes, 2621. Show, 204, 017. Showers of Fishes, 2621. Shreveport, La., 2621, 1636. Shrew, 2622, 1820. Shrike, 2622. Shrike, 2022.
Shrimp, 2622, 718.
Shrovetide, 2622, 1705.
Shrove Tuesday, 1029, 1705, 2622.
Shubrick, William Branford, 2622.
Shuffeldt, Robert Wilson, 2623.
Shuffleboard, or Shovelboard, 2623.
Shuffleboard, or Shovelboard, 2623.
Shushan, 886, 2782.
Shuttle, 2599, 3112.
Shylock, 1459.
Siam, 2623, 410, 1683, 1826.
Siam, Gulf of, 2624, 162.
Siamese Twins, 2625.
Siberia, 2625, 165, 1409, 3059.
Sibley, William H., 1608.
Sibyls, 2626; Sibylline Books, 2626.
Sicard, Montgomery, 2627.
Sichem (Palestine), 1456.
Sicillian Vespers, 2627, 2628.
Sicillies, The Two. See Sicilly, 2627.
Sicily, Island, 2627, 948, 1419, 1423, 2529, 3043.
Sickle, 2628, 2382, 2570.
Sickles, Daniel Edgar, 2628. Shrimp, 2622, 718. Sicily, Island, 2027, 948, 1419, 1423, 252
Sickle, 2628, 2382, 2570.
Sickles, Daniel Edgar, 2628.
Siculus, Diodorus, 38.
Sicyon, Greece, 116.
Siddhartha, 395.
Siddons, Sarah, 2628.
Siderial Time, 2628, 763, 3203.
Sidney, Ohio, 2628.
Sidney, Algernon, 2629, 1447.
Sidney, Sir Philip, 2629, 2705.
Sidon, or Zidon, 2629, 640, 2197, 2953.
Sidra, Gulf of, 229, 1750.
Siege, 2629, 314, 2107, 2925.
Siegfried, 1129, 1968, 1969.
Siemens, Ernst Werner, 2630, 892, 895.
Siemens, Ernst Werner, 2630, 247.
Siemening, Rudolf, 2630, 2570.
Siena, or Sienna, Italy, 2631, 2644.
Sienkiewicz, Henryk, 2631.
Sierra Guadarrama, 2285, 2694.
Sierra Guadarrama, 2285, 2694. Sierra Guadarrama, 2285, 2694. Sierra Leone, 2631, 33. Sierra Madre Mountains, 2631, 1773 Sierra Morena Mountains, 2631, 2694. Sierra Nevada Mountains, California, 2631, 438. Sierra Nevada Mountains, Spain, 2632, 2694. Sieyès, Emmanuel Joseph, 2632. Sigebert II., 740. Sigel, Franz, 2632, 403. Sigismund, 2632, 195, 1131, 1344, 3222. Signsmund, 2032, 199, 1131, 1344, 3222. Signals, 2632, 1009. Signal Service, 2633, 2753. Sign Language. See Deaf-Mutes, 765. Signorelli, Luca, 2633. Sigourney, Lydia Huntley, 2633. Sigsbee, Charles Dwight, 2634, 2680. Sigurd, 2634.

Sihon, King, 91.

Sikhs, 2634; Sikh State, 2634.

Si-Kiang River, 2634, 563.

Silage. See Ensilage, 924.

Silas, 2862.

Silent System of Discipline, 182, 2316.

Silenus, 2634, 538, 1059, 1707, 2608.

Silica, 2635; carnelian, 486; chalcedony, 526; clay, 596; crystal, 718; flint, 1014; glass, 1149; mica, 1776; opal, 2041; quartz, 2346.

Silkoon, or Silicium, 2635, 547, 898.

Silk, 2635, 564, 1627, 2535.

Silk, Artificial, 2636.

Silkworm, 2636, 616, 1867.

Silkworm Gut, 2637.

Siloam, Pool of, 1849.

Silurian Age, 35, 1115, 2727.

Silurian Age, 35, 1115, 2727.

Silurian Age, 35, 115, 2727.

Silurian Age, 35.

Silver, 2637, 294, 547, 1803, 1826.

Silver, 2637, 294, 547, 1803, 1826.

Silver Age, 35.

Silvio, Monte, 1735.

Simcoe, John Graves, 2638.

Simcoe, Lake, 2638, 2038.

Simcoe, Lake, 2638, 2038.

Simcoen, 1455, 1577.

Simeon the Syrian, 2765.

Simile, 2638, 997, 1767.

Simms, William Gillmore, 2638, 2004.

Simon, Jules François, 2639, 1048.

Simonides, 176.

Simon Magus, 2639. Simon, Jules François, 2039, 1048.
Simonides, 176.
Simon Magus, 2639.
Simon, Zera, 3030; Simons, Menno, 1757.
Simoom, or Simoon, 2639, 3160.
Simplex Typesetting Machine, 2313.
Simplon, 2639, 2935. Simplon, 2639, 2935.
Simpson, Sir James Young, 2639, 94.
Simpson, Jeremiah, 2640.
Simpson, Matthew, 2640.
Sims, George Robert, 2640.
Sims, James Marion, 2640.
Sims, William Snowden, 2640.
Sinai, Mountain, 2640, 1455, 1858.
Sindh, or Sind, 2640, 1892.
Sindia, or Scindia, 2641, 1678.
Sinding, Christian, 2641.
Singapore, Asia, 2641, 2755. Sinding, Christian, 2641.
Singapore, Asia, 2641, 2755.
Singer, Isaac M., 2599.
Singing, 2641, 77, 572, 1799, 1879.
Single Tax, 2641, 1117.
Sing Sing. See OSSINING, 2061.
Sinigaglia, Italy, 24, 2958.
Sinn Fein Party, 1408.
Siouan, 2642, 1382, 2268.
Sioux, or Dakota, 2642, 731, 2644.
Sioux City, Iowa, 2642, 1403.
Sioux Falls, S. D., 2642, 2691.
Sioux Wars, 731, 2421, 2642.
Siphon, 2642. Siphon, 2642. Sirach, 118, 3252; Siren, 2643. Sirenia, 2643; dugong, 839. Sirens, 2643, 969, 2957. Sirius, or Dog Star, 2643, 2729. Sirius, Steamboat, 2732. Sirocco, or Scirocco, 2643, 3160. Sirocco, or Scirocco, 2643, 3160. Sisal, or Grass hemp, 1261, 1284. Sisters of Charity, 534. Sisters of Loreto, 1628. Sisters of Mercy, 1760. Sistine Chapel, 102, 3023. Sisyphus, 2643, 676. Sitka, Alaska, 2644, 50.

Sitting Bull, 2644, 731, 2642.
Sitting Bull Mountain, 1119.
Siut, or Assiut, Upper Egypt, 2644.
Siva, 2644, 357, 3057.
Six Nations. See Iroquois, 1412.
Sixtus I., of Rome, 2644, 2273.
Sixtus II., of Rome, 2644, 2273.
Sixtus III., of Rome, 2644, 3023.
Sixtus IV., of Rome, 2644, 3023.
Sixtus IV., of Rome, 2644, 3023.
Sixtus V., of Rome, 2644, 3023.
Skager Rack, or Skagerrak, 2645, 511.
Skagway, Alaska, 2645, 50, 762.
Skald, or Scald, 2645.
Skat, 2645; cards, 481.
Skate, 2645, 2379.
Skates, 2645; snowshoes, 2666.
Skating, 2645; roller skates, 2646.
Skeat, Walter William, 2646.
Skeleton, 2646, 332, 2648; teeth, 2832.
Skelton, John, 2646, 919, 2327.
Skeptics, 1194, 2647.
Skepticism, 2647, 2196.
Ski. See Skates, 2645.
Skimmer, 2647; scissorsbills, 2647.
Skin, 2647, 2099, 2785.
Skink, 2648, 1612.
Skins, 1079, 1556.
Skirret, 2648; gull, 1218.
Skobeleff, Mikhail, 1763.
Skua, or Jaeger Gull, 2648.
Skull, 2648, 697, 1273, 2646.
Skunk, 2649, 2252, 3109.
Skye, Island, 2649, 1277.
Skye Terrier. See Terrier, 2848.
Skylark, 1545.
Slag, 2649, 311.
Slamat Mountain, 1444.
Slander. See Libel, 1581. Sitting Bull, 2644, 731, 2642. Sitting Bull Mountain, 1119. Slamat Mountain, 1444 Slander. See Libel, 1581. Slate, 2649, 1115. Slate Pencils, 2145, 2649. Slater, Samuel, 2650. Slaughterhouse Cases, 2650. Slave River, 1663. Slavery, 2650; abolitionists, 7, 260, 384, 1099; Confederate States, 649; Dred Scott, 828; emancipation, 908; Missouri Compromise, 1813; negroes, 1918; peonage, 2154; serf, 2590; servile war, 2701. Slave Trade, 1268, 1918, 2650. Slavonia, 195, 1338, 2050. Slavonia, 195, 1338. Slavs, or Slavonians, 2651, 950, 2802. Sled, or Sledge, 2652. Sleep, 2652, 1852; dreams, 827, 2675; sulphonal, 2772. Sleeping Car, 2333, 2367. Sleeping Sickness, 2652. Sleigh. See Sled, 2652. Sleigh. See Slep, 2652.
Slemmer, Adam J., 1037.
Slick, Sam (T. C. Haliburton), 2327.
Slick, Sam (T. C. Haliburton), 2327.
Slidell, John, 2653, 2916, 3148.
Slide Rule, 2653.
Slime Mold, 2653.
Slime Mold, 2653.
Sling, 2653; David, 758.
Sloane, William Milligan, 2653.
Slocum, Henry Warner, 2653.
Slocum, Henry Warner, 2654.
Sloops, 2616; cutter, 732.
Sloth, 2654, 869.
Slot Machine, 2654.
Slovaks, 2654, 1339, 2651.
Slovenians, 2654.
Sloyd, 2654, 1700.

Slug, 2655, 1821, 2663.
Small Arms. See Arms, 149.
Smallpox, or Variola, 2655, 693, 1391, 1449.
Smeaton, John, 2655.
Smell. See Nose, 2000.
Smelt, 2655; salmon, 2505.
Smelting, 310, 1766, 1796.
Smerdis, 445, 753.
Smet, Peter John de, 2655.
Smetana, Friedrich, 2655.
Smilax, 2655, 2531.
Smiles, Samuel, 2656.
Smith, Adam, 2656, 920, 2255.
Smith, Alexander, 2656, 920.
Smith, Andrew Heermance, 2656. Smith, Andrew Heermance, 2656.
Smith, Andrew Jackson, 2656.
Smith, Charles Emory, 2656.
Smith, David Eugene, 2656.
Smith, Edmund Kirby, 2657, 460, 584. Smith, Edmund Kirby, 2657, 46
Smith, Eli, 2657.
Smith, Francis Hopkinson, 2657.
Smith, George Adam, 2657.
Smith, Gerrit, 2657.
Smith, Goldwin, 2657, 456, 2327.
Smith, Hamilton, 811.
Smith, Henry Boynton, 2658.
Smith, Hiram, 1368, 1850.
Smith, Hoke, 2658.
Smith, James, 2995. Smith, Hoke, 2658.
Smith, James, 2995.
Smith, John, 2658, 84, 2243.
Smith, Joseph, 2659, 1368, 1849, 1850, 3210.
Smith, Joseph, 2659, 1368, 1849, 1850, 3210.
Smith, Samuel Francis, 2659, 1353.
Smith, Sarah Lanman, 2657.
Smith, Sydney, 2659, 871.
Smith, William, 2659.
Smith, William Farrar, 2659.
Smith, William Robertson, 2660.
Smith, Sir William Sidney, 2660.
Smith College, 2660, 1989.
Smithfield, 2660, 238.
Smith-Premier Typewriter, 2952.
Smith's Falls, Ontario, 2660.
Smithson, James, 2660. Smithson, James, 2660. Smithson, James, 2660.
Smithsonian Institution, 2660, 3092.
Smoke, 2661; fire, 1001.
Smokeless Powder, 2661, 1220.
Smoky Mountains, 119, 2842.
Smolensk, Russia, 2661, 808.
Smollett, Tobias George, 2661, 3252.
Smolt, or Salmon-fry, 2506.
Smuggling, 2662, 2578. Smollett, Tobias George, 2661, 3252.

Smolt, or Salmon-fry, 2506.

Smuggling, 2662, 2578.

Smut, or Dustbrand, 2662, 1078.

Smyrna, Asia Minor, 2662, 166, 2943.

Smythe, Frederick, 2813.

Snail, 2663, 1821, 2655.

Snake Jugglers, or Charmers, 613.

Snake River, 2663, 1360, 2620.

Snakeroot, 2663; Snakeweed, 20.

Snakero, 2663; Snakeweed, 20.

Snakes, or Serpents, 2663, 166, 319, 612, 2331, 2341, 2377, 2397.

Snakes. See Shoshones, 2620.

Snapping Turtle, 2664, 2900.

Snehaetten, Mount, 1997.

Snell, Willebrord, 2703.

Snipe, 2664, 2515, 2517.

Snohomish, Wash., 2665.

Snorri Sturluson, 2665; saga, 2484.

Snow, 2665, 606; hail, 1232.

Snowberry, 2665; honeysuckle, 1318.

Snowbird, 2666; finch, 999.

Snow Bunting, 2666, 405.

Snowden Mountains, 3071. Snowden Mountains, 3071.

Snowdrop, 2666, 1021. Snow Line. See Snow, 2665. Snowplow, 2666; rotary plow, 2666. Snowshoe, 2666, 2645. Snowstorm, 313, 2752. Snuff. See Tobacco, 2887. Snyders, Frans, 2666. Soap, 2666, 70, 2811. Soapstone, or Steatite, 2667, 527, 2809. Sobieski. See John III., 1460. Social Democrats, 2667, 767. Social Democrats, 2667, 767.
Socialism, 2667, 1720, 2260, 2500.
Social Settlement, 2668, 20, 1335.
Society Islands, 2668, 2264.
Sociology, 2669; civilization, 588.
Socrates, 2669, 874, 1194, 2195, 3194.
Socratic Method, 2669.
Soda, 2670, 213.
Soda Water, 2670, 2575.
Sodium, 2670, 547, 2776.
Sodom, Syria, 2670, 1629.
Sodom, Apple of, 2670.
Soerabaya, 1445, 2780.
Sofia, or Sophia, Bulgaria, 2670, 401.
Soil, 2671, 39; alluvium, 74; clay, 596; loam, 1612; manure, 1700; sewage, 281, 2598.
Sokoto, Africa, 2671.
Solar Eclipse, 865.
Solar Engine, 2671, 932.
Solar Microscope, 2671, 1782.
Solar System, 2671, 173, 855, 2231, 2534.
Solder, 2672; plumbers' solder, 2881.
Soldiers' Homes, 2672, 763.
Soley, James Russell, 2672.
Solferino, Battle of, 2672, 1897.
Solferino, Italy, 2672, 1423, 1897.
Solid, 2672, 1735, 2674.
Solis, Juan Diaz de, 138, 3004.
Solitaire, 2672, 482.
Solomon, 2672, 10, 759, 940, 1451, 1456.
Solomon, Song of, or Canticle, 2673, 289.
Solomon, Wisdom of, 2673, 289.
Solomon, Wisdom of, 2673, 289.
Solomon, Wisdom of, 2673, 289.
Solomon, 2674; saturated, 2368, 2674.
Solition, 2674; saturated, 2368, 2674.
Solway Firth, 2674, 917.
Solyman II., the Great, 2674, 536, 2492, 2943.
Somali, British, 2674, 1189.
Somaliland, Italian, 2675, 1421.
Somerset, Duke of, 878.
Somerset, Julands Socialism, 2667, 1720, 2260, 2500. Social Settlement, 2668, 20, 1335. Somaliland, Italian, 2675, 1421. Somerset, Duke of, 878. Somers Islands, 282.
Somersworth, N. H., 2675, 1942.
Somerville, Mass., 2675, 1729.
Somerville, Wary, 2675.
Somerville, William, 3252. Somme River, 2675, 2500. Somnambulism, 2675; sleep, 2652. Song of Solomon, 289, 2673. Sonnet, 2675, 1652, 2245. Sons of Liberty, 2676. Sons of Temperance, 2901. Sons of Veterans, 2676. Sonsonate, Salvador, 2676, 2510. Sontag, Henriette, 2676, 3002. Soochow, or Suchau, China, 2676. Soot. See Lampblack, 1536. Sophia. See Sofia, 2670. Sophia, Church of Saint, 2676, 133, 660, 814.

Sophia, Electress of Hanover, 2762. Sophia, or Sofia, Grand Duchess of Russia, 2172 Sophist, 2676, 2195, 2321; sophism, 972. Sophocles, 2677, 27, 1194. Sorata, Mountain, 2677, 15, 327. Sorata, Mountain, 2677, 15, 327.
Sorbonne, 2677, 2106.
Sorel, Quebec, 2677.
Sorghum, 2677, 382, 2770.
Sorrel, 2678; sorrel tree, 2678.
Sorrows of Werther, The, 1158.
Sothern, Edward Askew, 2678.
Sothiac Cycle, 2198.
Soudan, or Sudan, 2767 Sothiac Cycle, 2198.
Soudan, or Sudan, 2767.
Soul, 2678, 1370, 2327.
Soulanges Canal, 516.
Soulé, S. W., 2952.
Soult, Nicholas Jean, 2678, 2597.
Sound, 2679, 15, 853, 1879.
Sound, The, 2679, 781, 2645, 2785.
Sounding, 2679, 2571. Sound Instruments: megaphone, 1750; micro-Sound Instruments: megaphone, 1750; microphone, 1781; phonograph, 2199; photophone, 2203; telephone, 2837.

Sound Waves, 15, 853, 2679.

Sourabaya, or Soerabaya, Java, 1445.

Sousa, John Philip, 2680, 1879.

South African Republic. See Transvaal, 2911.

South African War, 2680.

South Ambov. N. J., 2681. South African War, 2680, South Amboy, N. J., 2681, South America, 2681, 82, 856, 3038. Southampton, England, 2685, 918. South Australia, 2685, 190, 192. South Bend, Ind., 2686, 1380. South Bethlehem, Page 2687. Southbridge, Mass., 2687. South Carolina, 2687, 649, 2978. South Carolina College, 2689. South Carolina, College, 2689.

South Carolina Exposition, 2689.

South Dakota, 2689, 1994, 2978.

South Dakota, University of, 2691.

Southern California, University of, 1629.

Southern Cross, 2691, 713.

Southern Lights, 186.

Southey, Robert, 2692, 622, 1548, 3243.

South Hadley, Mass., 2692.

South McAlester, Okl., 2692, 2028.

South Milwaukee, Wis., 2692.

South Mountain, Battle of, 2692, 1058.

South Norwalk, Conn., 2692.

South Omaha, Neb., 2692, 2792.

South Orange. N. J., 2693.

South Polar Expeditions, 2248, 2251.

South Polar Expeditions, 2248, 2251.

South Polar Expeditions, 2248, 2251.

South Porland, Me., 2693.

South Porland, Me., 2693. South Portland, Me., 2693. South Sea Scheme, 2693. South Shetland Islands, 2251.
South Shields, England, 2615.
Southwell, Robert, 3252.
Souvestre, 2602, 1015. Sovereign, 2693, 1215, 2298. Sovereignty, 2693, 1173, 2930. Sowing Machine, 2693; drilling, 832. Sow Thistle, 2694. Spa, Belgium, 247. Spaghetti, 1655. Spahis, 2694; Sepoy, 2588. Spaight, Richard Dobbs, 2989. Spain, 2694; Aragon, 127; Armada, 146, 825,

2697; Castile, 501; colonies, 628, 2696; Cuba, 719; Granada, 1177; inquisition, 1391; León, 1571; literature, 2696; Moors, 69, 1844; national debt, 767; national emblem, 1020; Pentional debt, 767; national emblem, 1020; Peninsular War, 2148; Portugal, 2285; Spanish Succession, 944, 2698; Spanish-American War, 722, 2698, 2982; universities, 2696, 2997. Spalding, John Lancaster, 2698. Spandau, Germany, 2698. Spaniel, 2698, 811, 2711. Spanish-American War, 2698, 524, 722, 1666, 2982. 2982. Spanish Armada, 146, 825, 2697. Spanish Fly, 263, 313. Spanish Fly, 205, 315.
Spanish Succession, War of, 196, 1131, 2628.
Spanish Town, Jamaica, 1434.
Spar (fluor spar), 1022; Iceland spar, 1794.
Sparks, Jared, 2699, 88.
Sparrow, 2699; house sparrow, 2700.
Sparrow Hawk, 2700, 1268. Sparta, or Lacedaemon, Greece, 2700, 150, 1282, 1648, 2144. Spartacus, 2701; gladiators, 1146. Spartanburg, S. C., 2701, 2688. Spartiatai, 2700. Spavin, 2701; bone spavin, 2701. Spawn, 2701, 1005, 2506. Speaker, 2701, 653, 2985. Speaking Trumpet, 2701, 1750. Spearmint. See Mint, 1803. Specie Payment, Resumption of, 2702. Species, 2702, 347; genus, 1111. Specific (in medicine), 2860. Specific Gravity, 2702, 1529, 1184. Specific Heat, 2702; heat, 1275. Spectacle, 2702; eye, 963; glasses, 963; lens, 1569. Spectacle Reef, 2245. Spectacled Snake, 612. Spectator, The, 2737. Spectator, The, 2737.
Spectroscope, 2703, 1058.
Spectroscopy, 1058.
Spectrum, 2703, 405, 629, 1058, 2315, 2776.
Speculum, 2703; in surgery, 2703.
Speech, 2703, 937, 1540, 2309, 3060.
Speedwell, 2703; brooklime, 2704.
Speke, John Hanning, 2704, 1977, 2814.
Spelling Reform, 2704, 2199.
Spelt, 3133.
Spelter. See Zing, 3920. Spelter. See ZINC, 3220. Spencer, Mass., 2704. Spelter. See ZINC, 3220.
Spencer, Mass., 2704.
Spencer, Herbert, 2704, 786, 874, 920, 1007.
Spencer, John F., 121.
Spencer, Samuel, 2705.
Spencer Gulf, 2705, 188, 2685.
Spenser, Edmund, 2705, 919, 3251.
Spermaceti, 2705, 461, 3132.
Spermatozoa, 2713.
Spermatozoa, 2713.
Sperm Oil, 2025, 2705.
Sperm Whale. See Whale, 3131.
Spey River, 3705, 2562.
Spezia, Italy, 2705.
Sphere, 2706.
Sphere, 2706.
Sphere, 2706.
Spheroidal State, 2706.
Spheroidal State, 2706.
Spheroidal State, 2706.
Sphinx, 2708, 2020, 2569.
Sphygmograph, 2706.
Spices, 2707, 584, 2008, 2155.
Spider, 2707, 1169, 2560, 2818.
Spider Monkey, 1828.

Spiegeleisen, 2737.
Spikenard, or Nard, 2708.
Spikes (botany). See Spikenard, 2708.
Spinach, or Spinage, 2708, 2356.
Spinal Column, or Spine, 2708, 2646.
Spinal Cord, 2709, 358; nerves, 1922.
Spindle, 2709, 803.
Spindle Tree, or Staff Tree, 2709.
Spinner, Francis Elias, 2709.
Spinning, 2709, 710, 3112.
Spinning Jenny, 2709, 710, 1252.
Spinning Mule, 710.
Spinning Wheel, 2710.
Spinning Wheel, 2710.
Spinola, Ambrosio, 2710.
Spinoza, Baruch, 2710, 1927, 2196.
Spires, Council of, 2322.
Spirit Lake, 1401, 1403, 2644.
Spiritualism, 2711; materialism, 1734.
Spirometer, 2711.
Spithead, 2711, 3146.
Spithead, Forts of, 2285, 2711.
Spitty, 2711. Spiegeleisen, 2737. Spitz, 2711. Spitzbergen, Islands, 2711, 1983, 3077. Spleen, or Milt, 2712. Splügen, 2712. Spofford, Ainsworth Rand, 2712. Spofford, Harriet Elizabeth, 2712. Spofford, Louis 2052 Spoliord, Flather Elizabeth, 2712.
Spohr, Louis, 3052.
Spoils System, 1429.
Spokane, Wash., 2712, 3095.
Sponge, 2713, 105, 805, 1006, 2232.
Spontaneous Combustion, 2713, 638.
Spontaneous Generation, or Abiogenesis, 2714. Spoonbill, 2714, 1294, 2621. Spooner, John Coit, 2714, 486. Spores, 296, 2322. Spotswood, Alexander, 2714. Spottsylvania Courthouse, Va., 2714, 1180, 1561
Spottsylvania Courthouse, Va., 2714, 1180, 1561
Sprague, William Buell, 2715.
Sprain, or Strain, 2715.
Sprat, or Garvie, 2715.
Spree River, 2715, 2542.
Spring, 2715, 3100; intermittent, 2715.
Spring, 2715, 2575.
Spring Balances, 213; weighing machine, 3117
Springbok, 2716; antelope, 110.
Springbok, 2716; antelope, 110.
Springfield, Ill., 2716, 2978.
Springfield, Mass., 2716, 1729.
Springfield, Mo., 2717, 1813.
Springfield, Ohio, 2717, 2024.
Springfield Rifle, 2420.
Spring Grove Cemetery, 518. Spring Grove Cemetery, 518. Springhill, Nova Scotia, 2717, 2003. Springnili, Nova Scotia, 2 Spring Tides, 2876. Spring Valley, Ill., 2717. Springville, Utah, 2717. Sprites, 2536; fairies, 969. Spruce, 2717, 1001, 2217. Spurge, 2717. Spurgeon, Charles Haddon, 2718, 3252. Spurgheim, Johann Gasper, 2204, 2206, 3251. Spuyten Duyvil Creek, 1253, 1960. Spy, 2718; Nathan Hale, 1235. Squadron, 2718. Square, 2718, 489; measure, 1744. Squash, 2718, 1172, 2335. Squatter, 2718; squatter sovereignty, 820, 2254. Squatters (Queensland), 2353. Squid, 2719; octopus, 2018. Squier, Ephraim George, 2719.

Squill, 2719; sea onion, 2719. Squinting, or Strabismus, 2719.
Squinting, or Strabismus, 2719.
Squirrel, 2719, 563, 569, 1024, 1165, 1712.
Squirrel Monkey. See Monkey, 1828.
Stabat Mater, 2720. Stadium, 2720; Olympic games, 2034. Stadtholder, 2720, 1737. Staël-Holstein, Madame de, 2720, 2383. Staff, 2721.
Staffa, Island of, 999.
Staffeldt, Adolf Wilhelm Schack, 783.
Stafford, Edmund, 959.
Stag, or Red Deer, 2721, 771.
Stag Beetle, 2721.
Staghound, 2721, 1328.
Stabl. Georg Ernet, 56 Stahl, Georg Ernst, 56. Stained Glass. See GLASS, 1149. Stainer, Jacob, 3052. Stainer, Sir John, 2721. Stairway, 222. Staked Plains, 139, 2851. Stalactite, 2721, 3190. Stalagmite, 2721, 3190. Stalagmite, 2721, 3190. Stamboul, Turkey, 660. Stamen, 2721, 111, 1020. Stamford, Conn., 2721, 657. Stamford Bridge, Battle of, 1255. Stammering, 3060. Stamp, 2722, 764; postage, 2290. Stamp Act, 2722, 2928, 3056. Stanbery, Henry, 2722. Standards, 1009, 2298. Standards, 1009, 2298.
Standards, Battle of the, 294.
Standard Time, 2722.
Standing Stones, 2750.
Standish, Miles, 2723, 2214.
Stanfield, Clarkson, 2724.
Stanford, Leland, 2724, 439, 1566.
Stanhope, Lady Hester Lucy, 2724.
Stanhope, Philip Henry, Farl, 2724. Stanhope, Philip Henry, Earl, 2724. Stanislas I., 2724, 1890. Stanislas II., 2724, 2247. Stanley, Falkland Islands, 972. Stanley, Arthur Penrhyn, 2724. Stanley, Dean, 153, 920, 3248. Stanley, Sir Henry Morton, 2725, 55, 912, 1114, 1611. Stanley Falls, 651. Stanley Pool, 651. Stanovoi Mountains, 2726, 1384, 2625. Stanserhorn Railway, 426. Stanton, Edwin McMasters, 2726, 1463. Stanton, Elizabeth Cady, 2726, 315. Starton, Elizabeth Cady, 2726, 3 Star Anis, 106. Starch, 2726, 678, 1027, 2505. Star Chamber, 2727, 536, 1178. Starfish, 2727, 864; radiates, 105. Stark, John, 2727, 276. Starling, 2728, 1743. Star of Bethlehem, 2728. Star of the South, 793. Starr, Ellen, 20, 1335.
Starr Route, 2728.
Stars, 2728, 173, 661; constellations, 660; milky way, 1788. way, 1788.
Star Spangled Banner, 221, 1504.
Starvation, or Inanition, 2729.
State, 2729, 1173.
State, Department of, 425, 2991.
Staten Island, 2730, 1959.
States-General, 2730, 1068.
States' Rights, 2730; nullification, 2005.

State University of Iowa, 1402. Statics, 2730, 849. Statistics, 2730. Statute, 2730, 642. Statute, 2730, 642.
Staubbach Falls, 2731, 3101.
Staunton, Va., 2731, 3056.
Staunton River, 2427.
Stavanger, Norway, 2731, 1999.
Stavropol, Russia, 2731.
Stead, William Thomas, 2731.
Steam, 2731, 2362, 2366, 3100.
Steamboat, 2732, 1008, 1078, 1910.
Steam Engine, 2733, 952, 2366.
Steam Gauge, 325.
Steam Hammer, 2735, 1243.
Steam Plow, 1103. Steam Hammer, 2735, 1243.
Steam Plow, 1103.
Steam Shovel, 2735; dredging, 828.
Steam Turbine, 2735; turbine, 2937.
Steam Whistle, 2736.
Stearic Acid, 2736.
Stearin, 2736, 461; stearic oil, 2025.
Stearin Candle, Flame of, 1010.
Steatite, 2667, 2809. Stedman, Edmund Clarence, 2736, 89. Steel, 2736, 285, 1410, 1522. Steel, Sir John, 2737. Steele, Sir Richard, 2737, 919. Steel Engraving, 2737; engraving, 923. Steel Framework, 134. Steel Magnet, 1675. Steelton, Pa., 2738. Steelyard, 2738, 213. Steen, Jan, 2738. Stehr, Hermann, 1130. Stein, Heinrich Friedrich, 2738. Steinbock, 2738, 1355. Stella (Esther Johnson), 2791. Stelvio, Pass of, 2738, Stem. See Plants, 2232, Stencil, 2738, Steno, Nicolaus, 1794, Stenography. See Shorthand, 2620.
Stephen, James, 986.
Stephen, of England, 2738.
Stephen, Sir Leslie, 2739, 920.
Stephen (popes), 2739, 2273.
Stephen I., of Hungary, 1339.
Stephen III., of Rome, 2155, 2273.
Stephens, Alexander Hamilton, 2739, 88, 649.
Stephens, John Lloyd, 2739.
Stephenson, George, 2739, 2366, 2735.
Stephenson, Robert, 2740, 968.
Stephenson, Robert, 2740, 968.
Steppes, 2740; Kirghiz Steppes, 2466.
Stereochromy, 3101.
Stereoscope, 2740, 3134.
Stereotype, 2741, 2099.
Sterlet, 2763.
Sterling, Ill., 2741, 2433. Stenography. See Shorthand, 2620. Sterlet, 2763.
Sterling, Ill., 2741, 2433.
Sternberg, George Miller, 2741.
Sternburg, Hermann Speck von, 2741.
Sterne, Laurence, 2741; Sterope, 2238.
Stethoscope, 2742, 187, 2157.
Stettin, Germany, 2742, 2019.
Stettinius, Edward R., 2742.
Steuben, Frederick William, 2742.
Steubenville, Obio, 2742, 2024. Steubenville, Ohio, 2742, 2024. Stevens, Alfred George, 2742, 2570. Stevens, Isaac J., 532. Stevens, Thaddeus, 2743. Stevens Institute, 1309. Stevenson, Adlai Ewing, 2743, 2976.

Stevenson, Robert, 2743. Stevenson, Robert Louis, 2743, 2439. Stevens Point, Wis., 2743, 3169. Stewart, Alexander Turney, 2744, 1096 Stewart, Balfour, 2744. Stewart, William Morris, 2744. Steyn, Martinus Theunis, 2744. Stheno, 1167. Stickleback, 2744. Stick-Seed, 2744. Stigma, 1020, 1076, 2721. Stigma, 1020, 1076, 2721.
Stilicho, Flavius, 2744, 49, 1318, 2627.
Still. A. T., 2745, 1512, 2062.
Stillingfleet, Edward, 576.
Stillman, William James, 2745.
Stillwater, Minn., 2745, 1802.
Stiltbird, or Stilt, 2745, 2229.
Stiltbird, or Stilt, 2745, 2229.
Stipules, 1555.
Stirling, Scotland, 2745.
Stirling, James Hutchinson, 2745.
Stirling, Sir Thomas, 2746.
Stjernhjelm, Georg, 2787.
Stoat, 933, 3110. Stoat, 933, 3110. Stockbridge, Mass., 2746. Stockbridge, Francis B., 415. Stock Exchange, 2746; Board of Trade, 320. Stockfish, 1597. Stockfish, 1597.
Stockholm, Sweden, 2746, 2787.
Stockport, England, 2747.
Stocks, 2215; rack, 2900.
Stockton, Cal., 2747, 440.
Stockton, Francis Richard, 2747, 89.
Stockton, Richard, 2995.
Stockton, Robert Field, 2747.
Stoddard, Richard Henry, 2747, 89, 3237.
Stoddard, William Osborn, 2747.
Stoics, 2748, 2196, 3218. Stoddard, William Osborn, 2747.

Stoics, 2748, 2196, 3218.

Stokes, Whitley, 2748.

Stoke-upon-Trent, England, 2748.

Stola, 2748; tunic, 2934.

Stoloo, C. Licinius, 37.

Stomach, 2748, 120, 2208; gizzard, 1145.

Stomates, or Pores, 1555.

Stone (gall), 292, 1607.

Stone, 2749, 1115, 1179, 2750.

Stone, Blarney, 310.

Stone, Ellen, 315.

Stone, Lucy, 2749, 373.

Stone, Thomas, 2995.

Stone Age, 2749, 381.

Stonechat, 2749; warblers, 3080.

Stone Circles, or Standing Stones, 2750.

Stoneham, Mass., 2750. Stoneham, Mass., 2750. Stonehenge, 2750.
Stone Implements, 2749.
Stone of Destiny, 2560.
Stone River, Battle of, 707, 2451, 2612.
Stones. See Geology, 1114.
Stones, Precious, 2750, 1542; amethyst, 89; diamond, 479, 793; emerald, 910; garnet, 1098; lapis lazuli, 1542; opal, 2041; ruby, 2459; sapphire, 2527; topaz, 2895; turquoise, 2946.
Stones, Rocking, 2432.
Stony Point, N. Y., 2750, 3109.
Stoppage in Transit, 2751.
Storage Battery, 13, 197, 895.
Storax, 2751; styrax, 2751.
Storer, Bellamy, 2751.
Storer, Bellamy, 2751.
Storer, 2751, 696, 1294.
Storms, 2752, 734, 1232, 3137, 3159. Stonehenge, 2750.

Storrs, Richard Salter, 2753. Story, Joseph, 2753, 1239. Story, William Wetmore, 2753. Stoss, Veit, 2753. Stothard, Thomas, 2753. Stoughton, Mass., 2753. Stovaine, 94. Stove, 2753, 609; oven, 365. Stove, Air, 43. Stowe, Harriet, 2754, 88, 2004. Strabismus, 2719, 2640. Strabo, 2755, 80, 1280, 1113, 1194, 2934. Stradivari, Antonio, 2755, 3052. Strafford, Thomas Wentworth, 2755. Straits Settlements, 2755, 1682, 2641. Stralsund, Germany, 2266. Strassburg, or Strasburg, Germany, 2755. Strassburg Clock, 2756, 196, 606. Stratford, Ontario, 2756, 2040. Stratford de Redcliffe, Sir Stratford, 2756. Stratford-on-Avon, England, 2757, 558. Strathcona, Alberta, 55. Strathcona, Donald Alexander Smith, 2757. Stratification, 2757, 1364, 1767. Strato of Lampsacus, 2160. Stratton, Charles S., 234, 847. Stratus Clouds, 607. Straus, Oscar Solomon, 2757. Strauss, David Frederich, 2757, 1130. Strauss, David Frederich, 2757, 1130.
Strauss, Johann, 2758, 3079.
Strauss, Johann, 2758, 3079.
Strauss, Richard, 2758.
Straws, 2758, 2478, 3133.
Strawberry, 2759, 1075.
Strawberry Tree, 129.
Strawbridge, Robert, 1058.
Streator, Ill., 2759, 1367.
Street, George Edmund, 2759.
Street Railway, 2759, 426, 895, 2909.
Strength of Materials, 2760; architecture, 132.
Strike, 2761; labor, 1525.
Striped Bass, 243.
Strobel, Edward Henry, 2761.
Stroboscope, 2761; kinetoscope, 1508. Strobel, Edward Henry, 2761.
Stroboscope, 2761; kinetoscope, 1508.
Stromboli, Mount, 1600, 1750.
Strombus, 2761; conch, 645, 2922.
Stromness, Orkneys, 2055.
Strömö, Island, 978.
Strontium, 2761, 547, 1766.
Struma River, 400, 2940.
Struye, Eriedrich Georg, William, 2762. Struma River, 400, 2940. Struve, Friedrich Georg William, 2762. Strychnine, 2762, 2009, 2246. Stuart, or Stewart, 2762, 904. Stuart, Charles Edward. See Charles Edward. 538. Stuart, Gilbert Charles, 2762, 1239. Stuart, Henry, Lord Darnley, 754. Stuart, James Edward, 2762, 2765. Stuart, James Ewell Brown, 2762, 2415. Stuart, Mary, Queen of Scots, 1723, 754. Stuart, Moses, 2762. Stuart, Ruth McEnery, 2763. Stubbs William, 2763. Stuart, Ruth McEnery, 2763.
Stubbs, William, 2763.
Stucco, 2763; gypsum. 1225.
Sturgeon, 2763, 211, 498.
Sturgis, Russell, 2763.
Sturm, Johannes von, 2764.
Stuttgart, Germany, 2764, 1583.
Stuyvesant, Peter. 2764, 1945, 1959.
Style (botany), 1020, 1076.
Stylites, or Pillar Saints, 2764.
Styptic, 2765; blood, 314.

Styria, 195, 986. Styx, 2765, 15, 129. Suakim, or Suakin, Egypt, 2765. Sublimation, 2765; sublimate, 682, 2765. Sublime Porte, 660, 2513. Submarine Navigation. See Torpedo Boat, 2898. Subpoena, 3172, 3187. Subsoil, 2671; loam, 1612. Subtraction, 66, 141. Subway, 1962, 2368, 2936. Succession War, 2765, 2628 Suchau. See Soochow, 2676.
Sucker, 2766; Missouri sucker, 2767.
Sucre, or Chuquisaca, Bolivia, 2766, 328.
Sudan, or Soudan, 2767, 33, 1505, 1519, 2486, 2586, 2929. Sudermann, Hermann, 2767, 1130. Sue, Marie Joseph Eugéne, 2768, 817, 3080. Suet, 418, 2031. Suetonius Tranquillus, Gaius, 2768. Suevi, 2783, 3189; alemanni, 60. Suez, Egypt, 2768, 883. Suez Canal, 2768, 489, 473, 883, 1574. Suez Canal, 2768, 459, 473, 883, 15 Suffrage, 2768, 888, 1614. Sufi, Ismail, 2164. Sugar, 2769, 350, 1153, 1702, 2480. Sugar Beet, 262, 2770. Sugar Cane. See Sugar, 2769. Suicide, 2770, 1250. Suisun Bay, 2518. Sukti 357 Sukti, 357. Suleiman, or Solyman, 2674. Suliotes, 2771; Marco Bozzaris, 354. Sulky, 2771, 491. Sulky, 2771, 491.
Sulla, Lucius, 2771, 584, 1476, 1710, 1815.
Sullivan, Sir Arthur Seymour, 2771, 1353, 2041.
Sullivan, John, 2772, 1625.
Sullivan's Island, 2772, 1037.
Sully, James, 2772.
Sully, Maximilien de Béthune, 2772.
Sulphate of Lime, 2773.
Sulphates, 2772; sulphides, 1766.
Sulphonal, 2772; sleep, 2652.
Sulphur, 2773, 547, 1220, 1733.
Sulphureted Hydrogen, 2773. Sulphur, 2773, 547, 1220, 1733, Sulphureted Hydrogen, 2773. Sulphuric Acid, 2773, 15. Sulphurous Acid, 2773, Sultan, 2773, 1824. Sulte, Benjamin, 456. Sulu Islands, 2773, 1252, 2191. Sulzbach, Germany, 2073. Sumac, or Sumach, 2774, 849. Sumatra, Island, 2774, 1683. Sumatra, Island, 2774, 1683. Sumbawa, Island, 2774, 2777. Summer, 2775; solstice, 856. Summer, Charles, 2775, 88. Sumner, Edwin Vose, 2775. Sumner, S. B., 3238. Sumptuary Laws, 2775; blue laws, 318. Sumter, Fort, 97, 539, 1038, 2981. Sumter, Fort, 97, 56, 2688. Sumter, Thomas, 2776. Sum, 2776, 173, 865, 2231, 2671. Sunbird, 2777. Sunbird, 2777. Sunbury, Pa., 2777. Sundary, Pa., 2777.

Sunda, Strait of, 1444, 2774.

Sunda Islands, 2777, 2774.

Sun Dance, 2777; war dances, 748.

Sunday, 2777, 1311, 3116; Sunday River, 68.

Sunday, William Ashley, 2775, 2408.

Sunday Schools, 2777, 2365. Sunderland, England, 2778, 918. Sundew, 2778, 487. Sundial. See DIAL, 793; Sunfish, 2778. Sunflower, 2779, 2025. Sunflower State. 1021, 1488. Sunnites, 2779. 29, 69, 1819. Sunrise City, Alaska, 50. Sun Spots, or Maculae, 174, 2776. Sunstroke, 2779. Sun Worship, 2779, 1363. Superintendent of Schools, 875, 2554. Superior, Lake, 2780, 1533. Superior, Wis., 2780, 3169. Supernaturalism, 2780, 2376. Superstitions, 172, 866, 1843, 3122, 3171. Supreme Court, 690, 2988.
Supreme Court, Justice of, 1077, 2988.
Surabaya, or Soerabaya, Java, 2780.
Surajah, or Sorajah, Dowlah, 306, 434. Surajaĥ, or Sorajah, Dowlah, 306, 434. Surakarta, or Soerakarta, Java, 2781. Surat, India, 2781, 1377. Surgery, 2781, 93, 114, 120; autoplasty, 198. Surinam, or Dutch Guiana, 1214. Surinam River, 2781, 1214. Surmullet, 2781; mullet, 1868. Surrey, 2781; carriage, 490. Surrey, Henry Howard, 2781, 919, 1287. Surtax, 731, 2819. Surveying, 2782, 241, 526, 611, 1221. Susa, Persia, 2782, 754. Susa, Persia, 2782, 754. Susanna, Book of, 118, 289. Susquehanna River, 2783, 2149. Susquehanna River, 2783, 2149.
Sutherland Falls, 3101.
Sutlej River, 2783, 2336.
Suttee, 2783; burial, 408.
Sutton, England, 2242.
Suvaroff, Alexi Vassilievitch, 2783.
Suwanee River, 1016.
Swabia, or Suabia, 2783; Alemanni, 60.
Swain, Charles, 3247.
Swallow, 2783, 2790; sand martin, 2784.
Swallow, 51las C., 2319.
Swamp. See MARSH, 1715; United States, subhead Agriculture, 2971.
Swamp Fox, 1709.
Swamps, 736, 1715; Dismal Swamp, 803; Everglades, 954; Pontine Marshes, 2270; tundra, 2934. dra, 2934.

Swampscott, Mass., 2784.

Swan, 2784, 2144; Song of, 2785.

Swansea, Wales, 2785.

Swarga (paradise), 1385.

Sweat, 2785; sweat glands, 1148.

Sweden, 2785, 950; colonies in America, 775, 2979; Finland, 999; Lapland, 1543; languages, 783, 1999, 2787; literature, 2484, 2787; Norway, 1997; Reformation, 1222, 2388; Scandinavians, 782, 1999, 2545, 2787; Union of Calmar, 783, 1706; universities, 2787, 2997; wars with Russia, 1222, 1742, 2263, 2471.

Swedenborg, Emanuel, 2788, 2711, 3251.

Swedenborgians, 2789. dra, 2934. Swedenborg, Emanuel, 2788, 2711, Swedenborgians, 2789.
Swedish Movement Cure, 1598.
Sweeney, Joel Walker, 225.
Sweet, Alexander Edwin, 2789, 89.
Sweet Bay, Oil of, 1549.
Sweetbrier, or Eglantine, 2789.
Sweet Corn, 678.
Sweet Flag, 2789, 434.
Sweet Pea, 2790.

Sweet Potato, 2292. Sweet Potato, 2292.
Sweetwater, or San Diego Dam, 745.
Sweet William, 2790, 1021, 2696.
Swett, John, 2790.
Sweyn, or Svend, 2790, 467, 783.
Swift, 2799; swallow, 2783.
Swift, Dean, 2327.
Swift, Jonathan, 2790, 919, 3244, 3248, 3254.
Swimmers (Natatores) Swimmers (Natatores), 298. Swimming, 2791; drowning, 832. Swinburne, Algernon Charles, 2791. Swine, 2792, 320, 1544, 2277, 3088. Swinemunde, Germany, 3004. Swing, David, 2792, 3256. Swinton, William, 2793. Swinton, William, 2793.
Swiss Family Robinson, 3193.
Swiss Guard, 2793.
Switzerland, 2793, 950, 2399; Austrian influence, 195, 2795, 2839; literature, 34, 1129, 2795; national emblem, 1020; Reformation, 2389, 2796; universities, 283, 2795, 2997.
Sword, 2796, 149, 838.
Sword, 2796, 149, 838. Sword, 2790, 149, 636. Swordfish, 2796. Sybaris, Italy, 2797. Sycamore, 2797, 1702, 3177. Sydney, New South Wales, 2797, 1952. Sydney, New South Wales, 2797, Sydney, Nova Scotia, 2797, 468. Sydney, Algernon, 1447. Sydney, Sir Philip, 3077. Syke, Hebrides, 2561. Sylhet, India, 168. Syllogism, 2798, 1619. Sylva, Carmen, 903, 2327. Sylvester I., 2798, 2273. Sylvester II., 2798, 1339, 2273. Sylvester III., 2798. Symbol, 2798, 1, 141, 546, 3223. Symmes, John Cleves, 2798, 583. Symmes, John Cleves, 2798. Symmes' Hole, 2798. Symonds, John Addington, 2799. Symmes Flore, 2788.
Symonds, John Addington, 2799.
Sympathetic Nerves, 1923.
Synagogue, 2799; rabbi, 2359.
Synchronograph, 2799. Syncope, 967.
Syncope, 967.
Synod, 2799, 1648.
Syntax, 2799, 1176.
Synthesis, 94, 2999.
Synthetic Method, 2138, 2380. Synthetic Method, 2138, 2380.
Syphilistic Bronchitis, 380.
Syra, or Syros, Island, 2800.
Syracuse, Battle of, 248, 2800.
Syracuse, N. Y., 2800, 2975.
Syracuse, Sicily, 2800, 2627.
Syracuse University, 2801, 1958.
Syr-Darya, or Sir-Daria, River, 2801.
Syria, 2801, 1356, 2943; Canaan, 451; Druses, 834; Edom, 872; Jews, 1455; Maronites, 1713; Palestine, 2083; Philistines, 2192; Phoenicia, 2196; Semites, 2584; Tyre, 2953.
Syriac Version, 288: Peshito Version, 2801.
Syriac Literature, 2801. Syriac Version, 2801. Syriac Literature, 2801. Syrian Christians, 2802. Syrup (glucose), 1153, 2770. Szegedin, Hungary, 2802, 194, 1340, 2857.

T

T, 2803, 2951. Taal, Philippines, 2803, 2191. Tabard, 2803; tunic, 2934. Tabari, 2165. Tabasco, Battle of, 683.
Tabernacle, 2803, 2618; Shiloh, 2615.
Tabernacle, Mormon, 2508.
Tableland. See Plateau, 2233.
Table Mountain, or Tabelberg, 2804, 471. Table Mountain, or Tabelberg, 2804, 471.
Taboo, 2804.
Tabor, Mount, 2804, 2084.
Tabriz, or Tabreez, Persia, 2804, 2164.
Tacitus, Publius Cornelius, 2805, 2445.
Tacoma, Mount (or Rainier), 496, 2805.
Taconic Mountains, 2805.
Tactics, 2806. Hardee's, 1251 Taconic Mountains, 2805.
Tactics, 2806; Hardee's, 1251.
Tadolini, Adamo, 2807, 1727.
Tadpoles, 1073, 1545, 2887.
Tael (money), 1826.
Taft, Lorado, 2807, 2570.
Taft, William Howard, 2807, 390, 2192, 2976. Taft, William Howard, 2807, 39: Tagala Language, 2191. Taganrog, Russia, 2807, 2470. Taglioni, Marie, 2808. Tagus River, 2808, 1601. Tahiti, Island, 2808, 2223, 2668. Tahlequah, Okla., 2808. Tailor Bird, 2808, 299. Taine, Hippolyte Adolphe, 2808. Tai-Ping, Rebellion, 1166, 2296. Tai-Pings, 2808. Tait, Archibald Campbell, 2809. Taiwan, or Formosa, 1034. Taj Mahal, 2809, 2601. Taku, China, 2809. Taku, China, 2809. Taku Forts, 569, 2877. Taku Inlet, 50. Talavera, Battle of, 3120. Talavera, Battle of, 3120.
Talavera, Battle of, 3120.
Talc, 2809, 1794, 2294.
Talca, Chile, 2809, 560.
Talent, 2809, 822.
Talisman, 2809; fetich, 991.
Talladega, Ala, 2810, 47. Tallahassee, Fla., 2810, 2978. Tallahassee, River, 45, 47. Tallard, Camille de la Baume, 944. Tall Buildings, 900, 554, 1961. Talleyrand-Périgord, Charles Ma Maurice, 2810, 380, 3197. 380, 3197.
Tallien, Jean Lambert, 2810.
Tallow, 2811, 461, 2025, 2667; vegetable, 2811.
Tallow Tree, 2811.
Talma, François Joseph, 2811.
Talmage, Thomas DeWitt, 2811, 88.
Talmud, 2811, 1458.
Tamaqua, Pa., 2812.
Tamarack, 1544.
Tamarind, 2812.
Tamarisk, 2812; German tamarind, 2812.
Tamarisk, 2812; German tamarind, 2812.
Tamarisk, Manna, 1698. Tamarisk, Manna, 1698. Tamatave, 110, 1669. Tambourine, 2812, 1163.
Tambourine, 2812, 1163.
Tambroni, Clotilda, 329.
Tamerlane. See TIMUR, 2880.
Tamil, 2812, 827.
Tammany Society, 2812, 709, 1615. Tammany Society, 2812, 709, 1615.
Tam o'Shanter, Doon of, 200.
Tampa, Fla., 2813, 1018.
Tampa Bay, 2813, 788.
Tampico, Mexico, 2813.
Tana River, 2813, 1997.
Tanager, 2813, 3080.
Tananarivo. See Antananarivo, 109.
Tancred, 2813.
Tancred de Hauteville, 1216.

Tanera, Karl, 2813. Taney, Roger Brooke, 2814, 220, 828, 1666. Tanganyika, Lake, 2814, 31, 473, 2956. Tangent, 1030.
Tangier, or Tangiers, 2814.
Tanjore, India, 2814.
Tannhäuser, or Tanhauser, 2814, 3069.
Tannin, or Tannic Acid, 2815.
Tanning. See Leather, 1556.
Tanrec, or Tenrec, 2815.
Tansy, 2815; Oil of, 2815.
Tantalum, 547.
Tantalum, 547.
Tantalus, 2815, 1978, 2144.
Tantra, 2815; Vedas, 3024.
Taoism, 2816, 566, 2394.
Tapajos River, 2815, 80.
Tapestry, 2816, 551.
Tapeworm, 2816, 925, 989, 2104.
Tapioca, 2817; tapioca meal, 154. Tangent, 1030. Tapioca, 2817; tapioca meal, 154. Tapir, 2817, 2407. Tapir, 2817, 2407.
Tappan, Lewis, 1582.
Tappia, Giovanni di, 658.
Tar, 2817, 610, 2223.
Taranto, Italy, 2818.
Tarantula, or Tarentula, 2818, 2708.
Tarapacá, 2818, 559.
Tarbell, Ida Minerva, 2818.
Tare, 2818; pea, 2129.
Tarentum, Pa., 2818.
Target, 2818; shooting, 2620.
Targum, 2819.
Tarifa, Spain, 2819.
Tariff, 2819, 800, 1790, 2321, 2384.
Tariff for Revenue Only, 2820.
Tarik Ibn-Zeyad, 1139. Tarik Ibn-Zeyad, 1139. Tarik Ibn-Zeyad, 1139.
Tarim Desert, 164, 2939.
Tarkington, Newton Booth, 2820.
Tarleton, Sir Banastre, 2820, 692.
Tarn River, 2820.
Tarnopol, Austria, 2820, 1086.
Tarpeian Rock, 2820, 476.
Tarpon, 2820.
Tarquin, Lucius, 2820, 476, 2442.
Tarquin, Lucius, 2821, 1643, 2442.
Tarquino, 719 Tarquino, 719. Tarrytown, N. Y., 2821, 99. Tarshish, 2821. Tarsus, Asia Minor, 2821, 735. Tarsus, Asia Minor, 2821, 735.
Tartaglia, Niccolò, 1220.
Tartar, 699, 2833.
Tartar City, 2141.
Tartar Emetic, 2821.
Tartaric Acid, 2821, 15, 2547.
Tartaric Acid, 2821, 15, 2547.
Tartaric, 2822, 409, 685, 2469, 2937.
Tartarus, 2822, 2241, 2815, 2883.
Tartary, 2822; Chinese Wall, 569.
Taschereau, Elzéar Alexandre, 2822.
Tashkend, or Tashkent, Russia, 2825. Taschereau, Elzear Alexandre, 2822.
Taschereau, or Taschent, Russia, 2822, 2939.
Tasman, Abel J., 998, 1113, 1966, 2823.
Tasmania, 2822, 191, 629.
Tasmanian Wolf, 2824.
Tasso, Torquato, 2824, 1157, 2813.
Taste, 2824, 2099, 2894.
Tate, Nahum, 1548.
Tattersall's, 2825; Tattersall, Richard, 2825. Tattoo, 2825. Tauchnitz, Karl Christoph, 2825, 2883. Tauler, Johann, 2825. Taunton, Mass., 2825, 1729. Taunton River, 1727, 2825. Taurus, 2238, 3223. Taurus, the Bull, 3223.

Taurus Mountains, 2825, 166, 2801. Tautog, or Blackfish, 305. Tawing, 1556.
Tawing, 1556.
Tax, 2826, 731, 2262, 2819; income tax, 1372; inheritance tax, 1388; tithes, 2883.
Taxidermy, 2827.
Taxonomy, 3225.
Tay, Firth of, 2561. Taxonomy, 3225.
Tay, Firth of, 2561.
Tay River, 2827, 2562.
Taygete, Star, 2237.
Taygetus, Mount, 1192.
Taylor, Tex., 2827.
Taylor, Andrew Thomas, 2827.
Taylor, Bayard, 2827, 88.
Taylor, George, 2995.
Taylor, Henry Clay, 2828.
Taylor, Jeremy, 2828, 919.
Taylor, Joseph W., 391.
Taylor, Joseph W., 391.
Taylor, Gen. R. B., 460.
Taylor, William, 2828.
Taylor, William, 2828.
Taylor, Zachary, 2828, 498, 2976.
Taylor Hospital, 2567.
Taylorville, Ill., 2829.
Tchad. See Tsad, 2929.
Tea, 2829, 430, 565.
Teach, or Black Beard, 2221.
Teachers' College, 2830.
Teachers' Institute, 2830, 1984, 2555.
Teak, 2830; African oak, 2829.
Teal, 2831, 3145; duck, 837.
Tears (physiology), 962, 1528; (vegetable), 1884.
Technical Education, 2831; manual training, 1700.
Technology, Schools of, 873. Technology, Schools of, 873. Tecumseh, 2832, 1259, 2828, 3084. Teddy Bear, 812. Te Deum, 2832.
Teeth, 2832, 784; mastication, 1732.
Tegmen, or Endopleura, 2579.
Tegnér, Esaias, 2833, 2787. Tegnér, Esaias, 2833, 2787.
Tegucigalpa, Honduras, 2833, 1317.
Teheran, or Tehran, Persia, 2833, 2164.
Tehuantepec, Gulf of, 2834.
Tehuantepec, Isthmus of, 2834, 2617.
Tehuantepec, Mexico, 2834.
Tejado, Lerdo de, 795.
Tekeli, or Tököly, Emeric, 2834.
Telautograph, 2834, 1185.
Telegraph, 2834; Atlantic Cable, 426, 994; automatic repeater, 871; invention, 871, 1854, 3134.
Telegraphy, Wireless, 2836, 1705. Telegraphy, Wireless, 2836, 1705. Tel-el-Kebir, 126. Telemachus, 2837, 1757, 2958. Teleology, 1630. Teleology, 1630.
Telephone, 2837, 269, 871.
Telephote, 2203; electrograph, 892.
Telephotography, 2203.
Telescope, 2839, 996, 1087, 1569, 2015.
Telescopic Stars. 2728.
Tell, William, 2839, 2795, 3163.
Teller, Henry Moore, 2839.
Tellurium, 2839, 547, 2581.
Tellus of Athens, 2674; Tempe, 2839. Temiskaming, 2839, 2066.
Temperance. See Total Abstinence, 2901.
Temperance, Sons of, 2839, 2901.
Temperance Crusade, 2901. Temperature, 2840, 1600, 2861, 3100. Temperature of Flames, 1010. Tempering, 2840; annealing, 107. Templars, or Knights Templar, 2840, 570, 2185.

Temple, 2840, 1452; pagoda, 2079. Temple, Tex., 2841. Temple, Frederick, 2841. Temple, Sir William, 2790. Temple, Sir William, 2790.
Temple of Belus, 203, 204.
Temples, in rocks, 907; of Serapis, 1755.
Temacity, 2841, 620; ductility, 837.
Tenant, 2841, 1537.
Tench, 2841; carp, 488.
Tender, 2841, 1562, 1826.
Tendon, 2841, 1028, 1876, 1877.
Teneriffe, Island, 2841, 309, 460 Tendon, 2841, 1028, 1876, 1877.
Teneriffe, Island, 2841, 309, 460.
Teneriffe, Mount, 2842, 3061.
Teniers, David, 2842.
Tenkate, Jan Jacob Lodewijk, 2842.
Tennessee, 2842, 649, 2978.
Tennessee River, 2844, 1500.
Tennessee, Livingerijk, of 2844. Tennessee, University of, 2844.
Tenniel, Sir John, 2844.
Tennis, 2844; lawn tennis, 1552.
Tennyson, Alfred, Lord, 2845, 920, 1548.
Tennyson, Hallam, 2845.
Tenochtilean, or Tenochtitlan, Mexico, 201, 1772.
Tenor (music), 77, 3060.
Tent, 2845, 2803.
Tentacles, 1448, 1822.
Tenure of Office, 2846.
Tepic, Mexico, 2846.
Tepic, Mexico, 2846.
Tepiltz, Bohemia, 247, 324.
Terceira, Island, 2846, 524.
Terence, Publius, 2846, 826.
Terhune, Mary Virginia, 2846, 2327.
Terminal Bud, 395.
Termites, or White Ants, 2846, 109.
Tern, 2847, 2784; gull, 1218.
Ternate, 1823. Tennessee, University of, 2844. Tern, 2817, 2784; gull, 1218.
Ternate, 1823.
Terpsichore, 1878.
Terrace, 2847.
Terra Cotta, 2847.
Terra del Fuego, 2877.
Terrapin. See Torroise, 2899.
Terre Haute, Ind., 2848, 1380.
Terrell Tex. 2848. Terre Haute, Ind., 2848, 1380.
Terrell, Tex., 2848.
Terrier, 2848, 1044, 1234.
Terrigenous Deposits, 2572.
Territory, 2848, 49, 3213.
Terror, Reign of, 1069, 2429.
Terry, Alfred Howe, 2848, 1035.
Terry, Ellen Alicia, 2849, 1873.
Tertiary Period, 2849, 35, 1115.
Tertullian, Quintus Septimus, 2849.
Teruel, Marsilio de, 1838. Tertulian, Quintus Septimus, 2849.
Teruel, Marsilio de, 1838.
Tesla, Nikola, 2849, 892.
Testa. See Seed, 2579.
Test Oath, 2849.
Tetanus, or Lockjaw, 2850, 207, 2640.
Tetzel, Johann, 2850, 1647, 2389.
Teufelsdröckh, Herr Diogenes, 484.
Teutonic Knights, 2850, 570, 1514.
Teutonic, or Germanic Peoples, 60, 103, 148, 159, 920, 950, 1072, 1170, 1926, 2542, 2546, 2795, 2850, 3017. 2850, 3017. Teutons, 2850, 582, 1284, 2444. Teutons, 2850, 582, 1284, 2444.
Tewfik I., of Egypt, 1417.
Texarkana, Ark. and Tex., 2850, 145.
Texas, 2850, 1020, 1328, 2978.
Texas, University of, 2853, 187.
Thackeray, William Makepeace, 2853, 920, 3235.
Thaddeus (Judas), 119, 1475.
Thalberg, Sigismond, 2854.
Thaler, 2854, 813.
Thales, 2854, 173, 1116, 1747, 2595.

Thalia, 2854, 1174, 1878. Thallium, 2854, 547, 1766. Thames, Battle of the, 2854, 1259. Thames River, 2854, 1621. Thane, 2855. Thanet, Isle of, 2855. Thanksgiving Day, 2855, 129, 1311. Thanksgiving Day, 2855, 129, 13 Thasos, Island, 2855. Thayer, Sylvanus, 2855. Theater, 2855, 284; drama, 825. Theatines, 2856. Theban War, 2700. Thebes, Egypt, 2856. Thebes, Greece, 2857; Thebans, 926. Theia, 186, 1354. Theine, or Thein, 430, 619, 2830. Theiner, Augustin, 2857.
Theisen, 1157.
Theiss River, 2857, 751, 1338.
Themis, 2857, 3000.
Themistocles, 2858, 176, 2062, 2503. Theocracy, 2858, 1173. Theocritus, 2858, 1193. Theocritus, 2858, 1193.
Theodolite, 2858,
Theodoric, 2858, 1170.
Theodoric, 2858, 1170.
Theodosius, 2859, 136, 422, 2444, 3011.
Theodosius II., 422, 1340.
Theology, 2859, 1156.
Theophilus, Archbishop, 64.
Theophrastus, 2859, 1574, 2160.
Theosophy, 2859, 311.
Therapeutae, 2860 Therapeuties, 2860, 1734, 1749.
Therape, Saint, or Teresa, 2860, 485.
Therman of Tital 2441. Thermae of Titus, 2441. Thermal Ray, 1275. Thermal Spring, 2860, 2715. Thermic Balance, 329. Thermoelectricity, 2860, 890.
Thermograph, 2860.
Thermometer, 2861, 43, 967, 1275, 2383.
Thermopylae, or Pylae, 2861, 1572, 2700.
Thery, R. B., 197.
Theseum, 2861, 2862.
Theseus, 2862, 176, 901, 1803.
Thessalonians, Epistles to the, 2862, 289, 2880.
Thessalonica. See Salonica, 2507.
Thessaly, 2862.
Thetis, 2862, 14.
Theuriet, Andrew, 2862. Thermoelectricity, 2860, 890. Theuriet, Andrew, 2862. Thian Shan Mountains, 2862, 2939. Thibault, Jacques Anatole, 1050. Thibet. See Tiber, 2874. Thiers, Louis, 2863, 690, 1048, 1050. Third Estate, 1068. Third Estate, 1068.
Thirlwall, Connop, 2863.
Thirst, 2863; appetite, 120.
Thirty Tyrants, 2863, 1652.
Thirty Years' War, 2863, 150, 1223, 2788, 3075
See Reformation, 2388.
Thisbe, 2340 Thisbe, 2340. Thistle, 2864, 157. Thistle, Order of the, 2865. Thlinkeets, 50. Thoma, Hans, 2865. Thomas, George Henry, 2865, 590, 1899. Thomas, John, 501. Thomas, Joseph, 2865. Thomas, Lorenzo, 2866. Thomas, Saint, 2866, 119. Thomas, Theodore, 2866.

Thomas à Kempis. See Kempis, 1498. Thomas a Kempis. See Ken Thomas of Jerusalem, 2866. Thomasville, Ga., 2866. Thompson, David, 2866, 456. Thompson, David, 2866, 456.
Thompson, Denman, 2866, 826.
Thompson, George, 2866.
Thompson, James, 919.
Thompson, James Maurice, 2866, 89.
Thompson, Joseph Parrish, 2867.
Thompson, Launt, 2867, 2570.
Thompson, Richard Wigginton, 2867.
Thompson, Robert Ellis, 2867.
Thompson, Seton Ernest, 2594.
Thomson, Elihu, 2867.
Thomson, James, 2868, 3252, 3253, 3255.
Thomson, Sir William (Lord Kelvin), 2868.
Thor. 2868, 3116: Odin, 2019. Thor, 2868, 3116; Odin, 2019. Thoracic Duct, 2868, 1650. Thorax, 5, 187, 550.
Thorax, Bones of the, 2646.
Thoreau, Henry David, 2868, 87, 1606.
Thorium, 2869, 547, 1766; thoria, 858.
Thorn, Germany, 2869. Thorndike, Edward Lee, 2869. Thornton, Sir Edward, 383. Thornton, Matthew, 2995. Thornton, Matthew, 2995.
Thorwaldsen, Albert Bertel, 2869, 759, 2570.
Thothmes, 2869, 63.
Thought, 2870; psychology, 2327.
Thousand Islands, 2870, 2038.
Thrace, 2870, 2462.
Thracians, 2185, 2870.
Thrasher, 2870, 2599, 2709.
Threadworm, 2871.
Three Holy Children, Song of the 118, 288 Thread, 2870, 2399, 2709.
Threadworm, 2871.
Three Holy Children, Song of the, 118, 289.
Three Rivers, Mich., 2871.
Three Rivers, Quebec, 2871, 2350.
Three R's, 2359.
Threshing Machine, 2871.
Threshing Machine, 2871.
Throat, 2082, 2356, 2895; Thrips, 2872.
Thrift Stamps, 2722.
Thrush, 2872, 1510, 1816, 2422, 2429.
Thrush, or Sprue, 2872.
Thucydides, 2872.
Thugs, 2872; thuggee, 2872.
Thule, 2873; Ultima Thule, 2873.
Thullium, 547.
Thumann, Paul, 2873.
Thumb, Tom, General, 234, 847.
Thun, Lake, 2873, 1, 1397, 2793.
Thunder, 1590; thunderstorm, 892.
Thurible, 519.
Thurlow, Edward, 2873.
Thurlow, Edward, 2873.
Thurlow, Edward, 2873. Thurible, 519.
Thurlow, Edward, 2873.
Thurman, Allen Granberry, 2873.
Thursday. See Thor, 2868.
Thurston, Robert Henry, 2873.
Thwaites, Reuben Gold, 2873.
Thyme, 2874, 2025.
Tian-Shan. See Thian Shan, 2862.
Tiara, 2874, 2273.
Tiber River, 2874, 2442.
Tiberias, Sea of 1086. Tiber River, 2874, 2442.
Tiberias, Sea of, 1086.
Tiberius, Claudius Nero Caesar, 2874.
Tibet, or Thibet, 2874, 1533, 1689.
Tibia, 1028, 1562, 2647.
Tic Douloureux. See Neuralgia, 1928.
Ticino River, 2793.
Tick, 2875; parasites, 2104.

Ticknor, George, 2875, 88. Ticonderoga, N. Y., 2875, 71. 152, 408. Tides, 2876, 340, 2572. Tieck, Ludwig, 2876, 2439. Tiemann, Daniel F., 668. Tien-tsin, or Tientsin, China, 2877. 2142. Tien-tsin, Treaty of, 1034, 2142. Tien-tsin, Treaty of, 1034, 2142.
Tierra del Fuego, 2877, 137, 1113, 2120.
Tiffin, Ohio, 2877, 2024.
Tiffis, Russia, 2877, 2470.
Tiger, 2877, 487.
Tiger Cat, 2878, 2016.
Tiger Lily, 1592.
Tiglath-Pileser I., 2878, 170.
Tiglath-Pileser II., 171.
Tiglath-Pileser III., 2878, 204.
Tigris River, 2878, 945.
Tilden, Samuel Jones, 2878, 889, 1961.
Tile, 2879, 370, 824.
Tile drain, 39, 824. Tile drain, 39, 824. Tillman, Benjamin Ryan, 2879. Tile drain, 39, 824.
Tillman, Benjamin Ryan, 2879.
Tillotson, John, 3256.
Tilly, John, 2879, 573, 2100, 3075.
Tilsit, Germany, 2880.
Tilsit, Treaty of, 388, 1400, 2880.
Tilsit, Treaty of, 388, 1400, 2880.
Tilton, Theodore, 260.
Timber. See LUMBER, 1644.
Timbuctoo, Sudan, 2880, 2921.
Time, 35, 929, 1839, 2722, 3116.
Time, Standard, 2722.
Timoni, Emanuel, 1391.
Timor, Island, 2880, 1683.
Timorlaut, Islands, 2880.
Timothy, or Timotheus, 2880, 2862.
Timothy, Epistles to, 289, 2880.
Timothy Grass, 2880, 607, 1269.
Timur, 2880, 1418, 1483, 2939.
Tin, 2881, 547, 1766.
Tinder, 2881, 1733.
Tingley, Katharine A., 2859.
Tintoretto (Jacopo Robusti), 2883.
Tippecanoe River, 2882, 1259, 2832.
Tippo Sahib, 2882, 1347, 3119.
Tirlemont, Belgium, 2882.
Tirlemont, Belgium, 2882. Tirlemont, Belgium, 2882.
Tirlemont, Belgium, 2882.
Tiryns, Greece, 2882.
Tischendorf, Lobegott, 2882.
Tissot, James Joseph, 2883.
Tissues. See Connective Tissue, 657. Tisza, Koloman von, 2883. Titania, 1654, 2014. Titanic, The, 3280. Titanium, 2883, 547, 1766. Titans, 2883, 3000. Titans, 2883, 3000.
Titcomb, Timothy, 1312, 2327.
Tithes, 2883, 3041; Tithonus, 2884.
Titian, Tiziano, 2884, 2081, 3036.
Titicaca, Lake, 2884, 136, 2168, 2683.
Titlark, or Pipit, 2884, 723; lark, 1544.
Title, 2884, 771; easement, 859.
Title of Nobility, 1981, 2987.
Titles of Honor, 2885, 1484.
Titmarsh, Michael Angelo, 2327, 2854.
Titmouse, or Tit, 2885; warblers, 3080. Titmouse, or Tit, 2885; warblers, 3080. Titus, 2885. Titus, 2000.
Titus, Arch of, 2885, 134.
Titus, Epistle to, 2885, 289.
Titus, Flavius, 2885, 92, 1457, 2267.
Titusville, Pa., 2886.
Tivoli, Italy, 2886.
Tilascala 684 Tlascala, 684. Toadflax, 2886. Toads, 2886; frog, 1073; horned toad, 1323.

Toadstool, 34, 1078.
Tobacco, 2887, 1898, 2220.
Tobacco Worm, 2888.
Tobago, Island, 2888, 2887.
Tobit, Book of, 118, 289.
Toboggan, 2888, 2645.
Tobol River, 2888.
Tobolsk, Siberia, 2888, 2625.
Tocantins River, 2888, 362, 2425.
Tocqueville, Alexis Charles, 2889, 1048.
Todleben, Franz Eduard, 2889, 2577.
Tody, 2889. Todleben, Franz Eduard, 2889, 2577. Tody, 2889.
Toepfler-Holtz Machine, 894.
Toes, 404, 1028, 2646.
Toga, 2889, 830.
Togo, Heihachiro, 2889, 1442.
Togoland, 2889, 629, 1053.
Togrul Beg, 2582.
Tokat, or Tocat, Asiatic Turkey, 2890.
Tokay, Hungary, 2890.
Tokay Wine, 2890, 3162.
Tokelau, Island, 2264.
Tokio, or Tokyo, Japan, 2890, 2997. Tokay Wine, 2890, 3162.
Tokelau, Island, 2264.
Tokio, or Tokyo, Japan, 2890, 2997.
Tokio, University of, 2890.
Tököly. See Tekell, Emeric, 2834.
Toledo, Ohio, 2890, 2975.
Toledo, Spain, 2891, 2808.
Tollens, Hendrick, 1927.
Tolstoi, Lyof Nikolaivitch, 2891, 2470.
Toltec, or Tolteca, 2892, 201, 1775.
Toltec Gorge, 2892.
Tomaca, Mexico, 2892.
Tomahawk, 2892, 199.
Tomato, 2892, 463, 2453.
Tomb, 2893, 408, 2529.
Tombigbee River, 2893, 47, 1816.
Tompkins, Daniel D., 2893, 2976.
Tomsk, Siberia, 2893, 2626.
Tom-Tom, or Tam-Tam, 2893.
Ton, 2893, 3117.
Tonawanda, N. Y., 2893, 1995.
Tone, 2894, 1879.
Tonga Islands, 1071.
Tongaring, Mount, 1965.
Tongaring, or Tonguin, 2894, 1047. Tonga Islands, 1071.
Tongariro, Mount, 1965.
Tongking, or Tonquin, 2894, 1047.
Tongue, 2894, 2824, 3060.
Tonic, 2894, 333, 2346.
Tonka Bean, or Tonqua Bean, 2894.
Tonnage, 2894; carrier, 491.
Tonquin, 94, 613.
Tonsils, 2895, 2082.
Tonsilitis, 2356, 2895.
Tonsure, 2895; priest, 2308.
Tonty, Henry, 2895.
Tools, 199, 570, 998, 2540.
Toombs, Robert, 2895. Toombs, Robert, 2895. Toothache, 2833. Toothache, 2833.
Top, 2895; gyroscope, 1226.
Topaz, 2895, 1794, 2750.
Topeka, Kans., 2895, 2978.
Toplady, Augustus Montague, 2896.
Torah, Book of the, 1472.
Toral, General, 722, 2526.
Tornado. See Storm, 2752.
Tornea River, 2786.
Toronto, Ontario, 2896, 2039.
Toronto, University of, 2897, 454.
Torpedo (fish), 2897, 2379.
Torpedo (military device), 2897, 2806.
Torpedo Boat, 2898, 1911.
Torquemada, Thomas de, 2898.
Torrens Lake, 188, 963, 2685.

Torrens River, 21.
Torres, Luys Vaez de, 191.
Torres Strait, 2899, 1940.
Torrey, John, 2899.
Torricelli, Evangelista, 2899, 179, 234.
Torricelli Tube, 234. Torricellian Vacuum, 3009. Torrid Zone, 856, 3224. Torrington, Conn., 2899. Torsion Balance, 2899, 213, 897, 3117. Tort, 2899. Tort, 2899.
Tortoise, 2899, 2398.
Tortoise Shell, 2900, 3118.
Tortugas, 392, 835.
Torture, 2900; pillory, 2215.
Torus (botany), 1020.
Tory, 2900, 326, 360, 512.
Tostig, 1254.
Total Abstinence, 2901.
Totemism, 2902, 936, 1136, 1157.
Totila, 1898. Totila, 1898. Toucan, 2902, 298. Touch, 2902; feeling, 984, 2327. Touchstone, or Lydian Stone, 2903. Toulon, France, 2903, 235. Toulous, France, 2903, 235.
Toulouse, France, 2903, 1047.
Tourcoing, France, 2903.
Tourgée, Albion Winegar, 2903.
Tourmaline, 2904, 2252, 2750.
Tournament, 2904.
Tourniquet, 2904. Tournament, 2904.
Tourniquet, 2904.
Tours, France, 2904, 248.
Tours, France, 2904, 248.
Toussaint, François Dominique, 2904, 1272.
Tower, 2905, 697, 903.
Tower, Charlemagne, 2905.
Tower of London, 2905, 878.
Towers, Leaning, 329, 2222.
Towne, Charles Arnette, 2905.
Townshend, Charles, 2905.
Toxnonshend, Charles, 2905.
Trace-Albumins, 208.
Toxicology, 2906; poison, 2246.
Toxin, 208, 3204.
Tracery, 2906; bas-relief, 243.
Trachea, 2906, 1545, 1645, 2401.
Tracheotomy, 2906, 714.
Tracheotomy, 2906; igneous rock, 1364.
Tract, 2906; pamphlet, 2090.
Traction Engine, 2906, 2735.
Tract Movement, 1496, 1946, 2337.
Trace, Benjamin Franklin, 2907.
Trades Unions, 2907.
Trades Wind, See Wixn, 3159. Trade-Mark, 2907.
Trades Unions, 2907.
Trade Wind. See Wind, 3159.
Trading Company, 2907, 1332.
Trafalgar, Battle of, 1056.
Trafalgar, Cape, 2908, 1920, 2819.
Tragacanth, 2908.
Tragedy. See Drama, 825.
Tragopan, or Horned Pheasant, 2908.
Trailing Arbutus, 2908, 129.
Train. George Francis, 2908, 3256 Training Arbutus, 2908, 129.
Train, George Francis, 2908, 3256.
Trajan, Marcus, 2908, 96, 1147, 2238, 2444.
Trajan, Arch of, 2909, 96.
Trajan's Column, 2909.
Trajan's Wall. See Trajan, 2908.
Tramway, 2909; street railway, 2759.
Trance, 2909; coma, 637, 766.
Transcendental, 2909.
Transcendentalists, 86, 87 Transcendentalists, 86, 87. Transfiguration, The, 901, 2081.

Transformer, 2909. Transfusion of Blood, 2909, 315. Transit, 2910, 3030. Transmigration, 2910, 396, 2341. Trans-Mississippi Exposition, 2910, 960, 2035. Transportation, 2911, 640, 1759, 2365, 2616 Trans-Siberian Railway, 2365. Transvaal, 2911, 1522, 2042. Transylvania, 2912, 195. Transylvania, 2912, 195.
Transylvanian Alps, 489.
Trap, or Trappean Rock, 2913, 1323.
Trapani, Sicily, 2913.
Trapdoor Spider, 2913, 2708.
Trapping, 2913; game, 1093.
Traveler's Tree, 2913.
Traverse City, Mich., 2913.
Travertine, 2914; limestone, 1593.
Travis, William Barrett, 2914.
Trawling, 2914; trawls, 617.
Treadmill, 2914; prisons, 2315.
Treason, 2914, 181, 2988.
Treasure-Trove, 2914.
Treasury, Department of, 2991. Treasure-Trove, 2914.
Treasury, Department of, 2991.
Treasury State, 1833.
Treaty, 2914, 802.
Treaties: Aix-la-Chapelle, 44, 1634, 2979;
Amiens, 90; Ashburton, 161, 3114; Berlin, 282; Berlin-Congo, 301, 652; Clayton-Bulwer, 597; Ghent, 1136, 2980; Jay, 1446, 3197; Hague Peace Conference, 1231; Paris, 2108, 2982; Portsmouth, 2284, 2473; Ryswick, 2478; Utrecht, 2979, 3008; Versailles, 2980, 3037.
Trebia River, 2914, 494, 2208.
Trebia, Battle of, 1248.
Trebize 13, Asiatic Turkey, 2915, 306.
Tree, 129, 297, 1031.
Tree, Herbert Beerbohm, 2915.
Tree Frog, or Tree Toad, 2915.
Tree of Life, 523.
Trefoil, 2915, 607, 2604.
Tremolite, 2915; hornblende, 1323. Trefoil, 2915, 607, 2604.
Tremolite, 2915; hornblende, 1323.
Trench, 2915, 2806.
Trench, Richard Chenevix, 2915, 3252.
Trent, or Trient, Austria, 2915.
Trent, Council of, 2915.
Trent, William Peterfield, 2916.
Trent Affair, 2916, 2597, 2653, 3148.
Trenton, Battle of, 2916; Trenton, Mo., 2916.
Trenton, N. J., 2916, 1945.
Trenton Series, 2917.
Trent River, 2915; Trent Alps, 2953.
Trent River, in England, 2915, 415, 917.
Trepang, or Beche de Mer, 2917, 2265.
Trephining, or Trepanning, 2917.
Trespass, 2917.
Trespass, 2917.
Trevelyan, George Otto, 2917, 920. Trespass, 2917.
Trevelyan, George Otto, 2917, 920.
Trevithick, Richard, 2366.
Triangle, 2917, 2264.
Trianon, or Grand Trianon, 2917.
Triassic System, 2918, 1765.
Fribe, 2918, 1111, 1382.
Tribune, 2918.
Tribune, Daily, 1197 Tribune, Daily, 1197. Triceps, 146, 1876. Trichina, 2918, 1095. Trichina, 2918, 1095.
Trichiniasis, or Trichinosis, 2919.
Tricolor, 2919, 552.
Tricycle, 2919, 197.
Trier, or Treves, Germany, 2919.
Trierarch, 2921.
Triest, or Trieste, Austria, 2919, 194.
Trigonometry, 2919, 1734.

Trinidad, Col., 2920, 632.
Trinidad, Island, 2920, 1189, 3161.
Trinidad, Lake, 167, 2920.
Trinitrotoluene, 959.
Trinity College, 1260; Trinity Coll. Library, 1583.
Trinity, Doctrine of the, 2920, 1156.
Trinity River, 2920, 2851.
Trinity Sunday, 2920.
Trio, 2920; quartette, 2346.
Triple Alliance, 2920, 828.
Tripler, Charles E., 2920, 1600.
Tripoli, 2921, 768, 1447.
Tripoli, 2921, 33, 2941.
Tripoli, Tripoli, 2921, 768.
Tripolite, or Tripoli, 2921.
Trireme, 2921; galley, 1088.
Triton, 2921; Tritons, 2922.
Triton (animal), 2922, 646.
Triumph, 2922, 2268, 2560.
Triumvirate, 2922, 115, 697, 1573.
Triumvirate, 106.
Tricke, 106. Trinidad, Col., 2920, 632. Trixie, 106.
Trochee, 1028.
Troglodyte, 2922; cave dwellers, 513.
Trogon, 2922.
Trojan War, 14, 34, 942, 1277, 1316, 1754, 2925.
Trolling, 2922; angling, 103.
Trollope, Anthony, 2923.
Trolls, 2923.
Trombone, 2923.
Tromp, Cornelius, 2478, 2923.
Tromp, Martin van, 2923, 309.
Trondhjem, Norway, 2923, 1999.
Troödos, Mount, 736.
Trophy, 2924.
Tropic Bird, 2924; pelican, 2143. Trixie, 106. Troodos, Mount, 736.
Trophy, 2924.
Tropic Bird, 2924; pelican, 2143.
Tropics, 2924, 2575, 3224.
Troubadour, 2924, 2925.
Trousers, 830.
Trout, 2924, 1006.
Trouvelot, Leopold, 1226.
Trouvere, 2925.
Trouveridge, Lohn, Townsend, 21 Trouvere, 2925.
Trouvere, 2925, 1700 Townsend, 2925, 2327.
Troy, Asia Minor, 2925, 1316, 2957.
Troy, Ala., 2926.
Troy, N. Y., 2926, 1958.
Troy, Ohio, 2926.
Troyes, France, 2927; Treaty of, 1049, 1338.
Truckee River, 1414, 1930.
Truckee River, 1414, 1930.
Truckee River, 1414, 1930. Truckee River, 1414, 1930.
Trudeau, Edward Livingston, 2927.
True, Alfred Charles, 2927.
True, Bill, 293, 148.
Truffle, 2927, 1079, 2931.
Trumbull, Henry Clay, 2927.
Trumbull, John, 2927, 85.
Trumbull, Jonathan, 2928.
Trumbull, Lyman, 2928.
Trumpet, 2928, 2043, 2923.
Trumpet, Speaking, 2679.
Trumpet Flower, 2928; bignonia, 292.
Truro, Nova Scotia, 2928, 2003.
Trustee. 2928. Truro, Nova Scotia, 2928, 2003.
Trustee, 2928.
Trusts, 2929, 2641; monopoly, 1830.
Tryon, William, 3182.
Tsad, Lake, 2929, 31, 1304, 1486.
Tsaritsyn, Russia, 2930.
Tsarskoye Selo. See Tzarskoye, 2954.
Tschaikowsky, Peter Ilyitch, 2930.
Tsetse, 2930. Tsetse, 2930. Tsin Dynasty, 568.

Tuamotu Islands, 2264. Tuaregs, 2930, 1243, 1852. Tuberculosis, 2930, 662, 1517, 1929. Tuberose, 2931, 1021. Tubers, 400, 2293, 2448. Tübingen, Germany, 2931. Tübingen, University of, 2931, 2997. Tuckahoe, 2931; truffle, 2927. Tuckahoe, 2931; truffle, 2927.
Tucker, Saint George, 2931.
Tuckerman, Henry, 2931, 84, 3250.
Tucson, Ariz., 2932, 1768.
Tucumán, Argentina, 2932, 138.
Tudela, Battle of, 1541.
Tudor, 2932, 922.
Tuesday, 2932, 3116.
Tufa, 2932.
Tufts College, 2932, 345.
Tugela River, 1900.
Tulleries, 2932, 642, 2106.
Tula, Russia, 2932. Tularies, 2932, 422, 2106.
Tula, Russia, 2932.
Tulane University, 2933, 1950.
Tulare Lake, 438, 2967.
Tulip, 2933, 1021; Tulip Tree, 2933.
Tullus Hostilius, 51.
Tulsa, Okla., 2933.
Tumble Bugs, 263.
Tumor, 2933, 359.
Tundra, 2934, 2625.
Tungsten, 2934, 547, 1766.
Tungus, 2934.
Tunic, 2934, 830, 2747, 2803.
Tuning Fork, 2934.
Tunis, 2934, 33, 229, 493.
Tunis, 2934, 33, 229, 493.
Tunis, Tunis, 2934.
Tunnel, 2935, 1169, 1320, 2489, 2639.
Tunny, 2936, 2286.
Tupper, Sir Charles, 2936, 456.
Tupper, Martin Farquhar, 2936.
Turanian, 2937, 1000, 1543, 2944.
Turban, 2937.
Turbot, 2937, 2735, 3135. Tula, Russia, 2932. Turbine, 2937, 2735, 3135. Turbot, 2937, 2816. Turenne, Henri, 2937, 647, 3049. Turgenieff, Ivan, 2937, 1975. Turgot, Anne Robert, 2938, 1916. Turin, Italy, 2938; university, 2997.
Turkestan, 2938, 563, 2466, 2944, 3008.
Turkey, 2940, 2297; brush turkey, 388; Honduras turkey, 2940. duras turkey, 2940.

Turkey, or Ottoman Empire, 2940, 165, 950;
Albania, 51; Arabia, 124; Armenia, 147;
army, 2942; Balkan Free States, 215; Bulgaria, 400; Byzantine Empire, 422; Circassians, 585; Crete, 703; Crimean War, 705; Crusades, 716; Druses, 834; flag, 1009; harem, 1252; Janizaries, 1437; Jerusalem, 1451; Lemnos, 1568; Lesbos, 1574; Montenegro, 1836; Rumania, 2460; Servia, 2592; Suliots, 2771, 354; sultan, 2773; Syria, 2801; wars with Germany, 1058, 3047; wars with Hungary, 1339; wars with Poland, 1461, 2943. Turkey Buzzard, 421, 3066. Turkey Buzzard, 421, 3066.
Turkish Bath, 246.
Turkomans, 2944.
Turks, 2944, 1826, 2937.
Turks Islands, 2944, 1434.
Turmeric, 2945, 70.
Turner, Joseph Mallord, 2945.
Turner, Nat, 2945.
Turner, Sharon, 2945.
Turnip, 2945, 2009, 3025.

Turpentine, 2946, 1001, 2081. Turpie, David, 2946. Turpin, Dick, 373. Turquoise, 2946. Turtle, 2946, 2899. Turtledove, 2946, 821. Turtledove, 2946, 821.
Turtle Mountains, 1992.
Tuscaloosa, Ala., 2946, 47.
Tuscany, 2947, 3043.
Tuscaroras, 2947, 1412.
Tusculum, Latium, 2947.
Tuskegee, Ala., 2947, 47.
Tuskegee Normal, 2947, 3095.
Tussock Moth, 2947.
Tutuila. See Samoa, 2512.
Tuyères, 310.
Twain, Mark, 598, 2327.
Tweed, William Marcy, 2948.
Tweed Ring, 571, 1964, 2879. 2948.
Tweed River, 2948, 3.
Tweeds, 2948. Tweeds, 2948. Twelfth-Day, 2948. Twelve Tables, 2948, 2445. Twickenham, England, 2948. Twilight, 2948. Two Harbors, Minn., 1800. Two Harbors, Minn., 1800. Tyche, 1038. Tyler, Tex., 2949. Tyler, John, 2949, 2415, 2976, 3136. Tyler, Moses Coit, 2949. Tyler, Wat, 3106, 2413. Tyler, William Seymour, 2949. Tympanum, or Middle Ear, 15, 853. Tyndale, William, 2950, 288, 919. Tyndall, John, 2950, 290, 2458. Tyne River, 2950, 1937. Tyng, Stephen Higginson, 2950. Type, 2950, 686, 2313, 2952. Typesetting Machines, 1761, 2952. Type, 2950, 686, 2313, 2952.
Typesetting Machines, 1761, 2952.
Typewriter, 2952, 497.
Typhoid Fever, 2952, 993, 1274, 2773.
Typhoon. See Storms, 2752.
Typhus Fever, 2953.
Tyr, 2953, 3116.
Tyrant, 2953, 2863.
Tyre, Phoenicia, 2953, 62, 628, 2197.
Tyrian Purple Due, 2107, 2953. Tyre, Phoenicia, 2953, 62, 628, 2197. Tyrian Purple Dye, 2197, 2953. Tyrol, 2953, 195. Tyrone, Pa., 2954. Tyrrel, Sir Walter, 3151. Tzana, Lake, 10. Tzarskoye, Russia, 2954. Tzschirner, Heinrich Gottlieb, 2954.

U

U, 2955, 2198, 2951.
Ubangi River, 2955, 651.
Ucayali, or Ucayale, River, 2955, 2168.
Uchali, Treaty of, 11.
Udall, Nicholas, 2955.
Uffiza, 2955.
Uganda, Africa, 2955, 478.
Uhde, Fritz von, 2955, 478.
Uhland, Johann, 2956, 1130, 2245.
Uhlans, 2956; cavalry, 512.
Uinta Mountains, 2956, 3005.
Utilander, 33, 2681; Ulema (Turkish), 2942.
Ujiji, German East Africa, 2956, 2814.
Ukrania, 2956, 2471.

Ulfilas, 2956, 1170. Ullmann, Carl, 2956. Ulm, Germany, 2957, 3189. Ulrica Eleonora, Queen of Sweden, 2788. Ulrich I., Count of Württemberg, 3189. Ulster, Province of, 1406. Ultima Thule, 2615. Ultramarine, 2957, 1542. Ultramontanism, 2957. Ulysses, 2957, 443, 585, 1316, 2570, 2925. Umbagog, Lake, 100, 1941. Umbagliferae, 2958 Umbagog, Lake, 100, 1941. Umbelliferae, 2958. Umber, 2958; pigments, 2212. Umbria, 2958. Umbria, 2958. Unaka Mountains, 2842. Unalaska, Island, 2958, 3061. Uncas, 2958; Mohicans, 1820. Uncas, 2958; Mohicans, 1820. Unalaska, Island, 2958, 3061.
Uncas, 2958; Mohicans, 1820.
Unciae (coin), 159.
Uncial Letters, 2959, 241.
Uncle Remus, 1256, 2327.
Uncle Tom's Cabin, 88, 2754.
Unction, 2959, 2481.
Underground Railroad, 2959.
Underground Railway, 1622, 1962, 2935.
Undershot Wheel, 2959, 3135.
Underwood, Francis Henry, 2959.
Underwood, Oscar W., 2959.
Underwood Tariff Bill, 2820, 3280.
Undulatory Theory, 1587.
Ungava, Canada, 2959, 458, 2350.
Unger, Joseph, 2960.
Ungulata, 2960, 3077.
Unicorn, 2960; Unicorn Whale, 1898.
Uniform, 2961.
Uniformitarianism, 1114.
Union, N. J., 2961; Union, S. C., 2961.
Union College, 2548; Union Jack (Hag.), 1009.
Union Theological Seminary, 2961.
Union Theological Seminary, 2961.
Uniontown, Pa., 2961.
Unisexual, or Imperfect Flower, 1020.
Unit 2961, 141 Union Theological Seminary, 2961.
Uniontown, Pa., 2961.
Unisexual, or Imperfect Flower, 1020.
Unit, 2961, 141.
Unitarianism, 2962, 291, 443, 532.
United American Mechanics, 274.
United American Mechanics, Order of, 274.
United Brethren in Christ, 2962.
United Kingdom, 1186.
United Friends, Order of, 274.
United Friends, Order of, 274.
United Kingdom, 1186.
United Provinces, 1737, 1924, 3151.
United States, 2962, 1988; agriculture, 37, 38, 39, 2971; Alabama Claims, 47; Alien and Sedition Laws, 69, 983, 2256; animals, 2969; army, 151, 2976; arsenal, 154, 2433; banking, 226; Bureau of Education, 2977; cabinet, 425, 2991; canals, 459, 2093, 2973; census, 519, 2974; climate, 603, 2967; coal deposits, 609, 2970; coast survey, 611; colonies, 1210, 1265, 2187, 2282, 2512, 2984; commerce, 640, 2973; Confederate States, 649, 760; Congress, 652, 2976, 2984; Constitution, 661, 2984; copyright, 671; crops, 232, 678, 687, 1012, 2013, 2478, 2971, 2972, 3133; dairying, 511, 545, 741, 1787; departments of, 2991; Dorr's Rebellion, 818; drama, 826; electoral college, 889, 2975; emigration, 911; expositions, 555, 960, 2496, 3183; fisheries, 1006, 2506; flag, 1009; forests, 1031; government, 1173, 2975; Guam, 1210; Hartford convention, 1260; Hawaii, 1265; holidays, 1311; independence of, 2979, 2993: labor, 1526; land, 1816, 2782; libraries, 1584; life-saving

service, 1587; literature, 84; Mecklenburg Declaration, 1746; military academy, 3128; mining, 1795; mint, 1803; money, 812, 1826; Monroe Doctrine, 1832; national banks, 226, 1429; national emblem, 1020; national debt, Monroe Doctrine, 1832; national banks, 226, 1429; national emblem, 1020; national debt, 767, 1903; naturalization, 1905; naval academy, 106, 1908; navy, 1911; observatories, 2015; Oregon claim, 2051; Panama Canal, 2093; patent, 2121; pension, 2153; Philippines, 2187; Porto Rico, 2282; political parties, 779, 2256, 2399; population, 2974; post office, 2290; prairie, 2301; railroads, 2366; rainfall, 2369, 2967; religion, 2977, 2989; sanitary commission, 2521; schools, 875, 2554; seal fisheries, 1006, 2573; signal service, 2633; slavery, 908, 1918, 2650; stamps, 2290, 2722; states, 2978; stock raising, 511, 1324, 2792, 2972; tariff laws, 1063, 2321, 2384, 2819; taxes, 731, 1372, 2826; territories, 2978; territory annexed, 2982; thirteen original states, 655, 774, 1119, 1721, 1727, 1940, 1943, 1956, 1989, 2149, 2407, 2687, 2979, 3054; Tutuila, 2512; universities, 2997; wars, civil, 589, 1180, 2981; Creck, 701, 1429; French and Indian, 355, 2979; King George's, 2979; Mexican, 1775, 2853, 2980; of 1812, 1671, 2980; Philippines, 2192, 2982; Revolution, 2404, 2979; Seminole, 1018, 1429, 2584; Sioux, 731, 2642; Spanish-American, 722, 2982; Wake Island, 2984; X Y Z Correspondence, 3197. Inited States, Constitution, 2984, 661. 722, 2982; Wake Island, 2984; X Y Z Correspondence, 3197.
United States, Constitution, 2984, 661.
United States, Departments, 2991; agriculture, 40, 2993; commerce and labor, 641; interior, 2992; justice, 2993; navy, 2992; post office, 2290, 2992; state, 2991; treasury, 425, 2991; war, 2992.
United States, Independence, 2993.
United States Indian School, 2995.
United States Military Academy, 2995. United States Indian School, 2995. United States Military Academy, 2995. United Workmen, Ancient Order, 274. Univalves, 303, 1821, 2610. Universal Brotherhood, 2859. Universalists, 2996. Universal Language, 937, 3057, 3060. Universe, 2996. Universe, 2996.
University, 2996, 873, 1124, 2555.
University Education, Coöperative, 2998.
University Extension, 2998.
University of Chicago, 556, 2998.
University of Michigan, 107, 1779.
Unter den Linden, 281.
University of Switzerland, 2705, 2820. Unter den Linden, 281.
Unterwalden, Switzerland, 2795, 2839.
Unwin, Mrs., 693.
Upas, 2999; Upas Valley, 480.
Upchurch, John J., 96.
Upham, Charles Wentworth, 2999.
Upmark, Gustaf Heinrich Vilhelm, 2999.
Upolu, Island, 2512.
Upper Peninsula, 1778, 1780.
Upsala, Sweden, 2999, 2787.
Upsala, University of, 2787, 2997, 2999.
Upshur, Abel Parker, 2999.
Upshur, Abel Parker, 2999.
Ural Mountains, 3000, 162, 948.
Ural-Altaic Language, 1000, 2936.
Urania, 3000, 1878.
Uranium, 3000, 547 1766.
Uranus, or Coelus, 3000, 2883. Uranus, or Coelus, 3000, 2883. Uranus, 3000, 2231, 2534.

Urban I., of Rome, 3000, 2273.

Urban II., of Rome, 3000, 2273.
Urban IV., of Rome, 3000, 682.
Urban IV., of Rome, 3000, 682.
Urban V., of Rome, 3000, 2273.
Urban VI., of Rome, 3001.
Urban VII., of Rome, 3001.
Urban VIII., of Rome, 3001.
Urban VIII., of Rome, 3001.
Urbana, Ill., 3001.
Urbana, Ohio, 3001.
Urbino, Italy, 3001.
Urchin. See Sea Urchin, 2576.
Ureter, 1506, 3002.
Uri, Switzerland, 2795, 2839.
Uric Acid, 1172, 1506, 3002.
Urim and Thummin, 3001, 1849.
Urine, 3002, 1506, 2207.
Ursa Major and Ursa Minor, 253.
Urso, Camilla, 3002.
Ursulines, 3002; nun, 2006.
Uruguay, 3002, 361, 2684.
Uruguay, 3002, 361, 2684.
Uruguay, 3002, 361, 2684.
Uruguay, 3002, 361, 2684.
Urumiah, Persia, 3004.
Urumiah, Lake, 3004, 2163.
Usbeks. See Uzbeks, 3008.
Usedom, Island, 3004.
Usher, James, 919.
Usury, 3004, 1396.
Utah, 3004, 1021, 2978, 3210.
Utah, University of, 3007.
Utah, Lake, 3007, 1191.
Utahs, or Utes, 3007.
Utica, Africa, 3007, 1958.
Utilitarianism, 3007; philosophy, 2195.
Utopia, 3007, 1846.
Utrecht, Netherlands, 3008, 1927.
Utrecht, Treaty of, 3008, 537 1011, 2979.
Uz 3008; Job, 1459.
Uzbeks, 3008, 326.
Uzziah, 200, 1326, 1456.

V

V, 3009, 965, 2951.

Vaal River Colony, 2911.
Vaccination, 3009, 1449, 3057.
Vacuum, 3009, 1590, 2861.
Vacuum Pan, 3010.
Vacuum Tubes, 1107.
Vaillant, Marie Edouard, 3010.
Valdai Hills, 3010, 2467.
Valdez, Alaska, 197.
Valdivia, Chile, 3010.
Valdivia, Pedro de, 2526.
Valdosta, Ga., 3010.
Valencia, Spain, 3010, 2696.
Valencia, Venezuela, 3010: Lake, 3010.
Valenciennes, France, 1011.
Valentine, Basel, 3011.
Valentine, Basel, 3011.
Valentine, or Valentinus, 3011.
Valentinian I., Flavius, 3011.
Valentinian II., Flavius, 3011.
Valentinian III., Placidius, 3011, 2859.
Valentinian IIII., Placidius, 3011, 3018.
Valentinus, 3012, 1553.
Valetta, Malta, 3012, 1686.
Valette, John de la, 3012.

Valhalla. See WALHALLA, 3072. Valide, Sultana of Turkey, 660.
Valkyries, 3012.
Valladolid, Mexico, 3012.
Valladolid, Mexico, 3012.
Valladolid, Spain, 3012, 636, 987.
Vallandigham, Clement Laird, 3012.
Vallejo, Cal., 3013.
Vallejo, 3013, 934, 1145.
Valley, 3013, 934, 1145.
Valley City, N. D., 3013, 1994, 3041.
Valleyfield, Quebec, 3013.
Valleyfield, Quebec, 3013.
Vallombrosa, 3014.
Vallombrosa, 3014.
Valmy, Battle of, 3014, 248; Duke of, 1497.
Valmy, France, 3014.
Valois, House of, 3014, 1049, 2185.
Valparaiso, Chile, 3014, 560.
Valparaiso, Ind., 3014, 1379.
Value, 3015, 662, 2255.
Valve, 3015, 1003, 2734.
Vámbéry, Arminius, 3015. Valide, Sultana of Turkey, 660. Valve, 3015, 1003, 2734.
Vámbéry, Arminius, 3015.
Vampire, 3015.
Vampire Bat, 3015, 245.
Van, Asiatic Turkey, 3015.
Vanadium, 3015, 547, 1766.
Van Artevelde, Jacob, 1135.
Van Buren, Martin, 3016, 779, 2976.
Vance, Zebulon Baird, 3016.
Vancouver, British Columbia, 3017, 377.
Vancouver, George, 2051, 3017.
Vancouver, Island, 3016, 376, 378.
Vandals, 3017, 1111, 3011.
Vanderbilt, Cornelius, 3018. Vanderbilt, Cornelius, 3018. Vanderbilt, Cornelius, 3018, 333, Vanderbilt, William Henry, 3018. Vanderbilt, William Kissam, 3018. Vanderbilt University, 3019, 771, 1899. Vanderbilt University, 3019, 771, 1899.
Vanderlyn, John, 3019.
Van Der Stucken, Frank, 3019.
Vanderpool, Isaac V., 601.
Van Diemen, Governor, 1113, 2823.
Van Diemen's Land. See Tasmania, 2822.
Van Dorn, Earl, 3019, 676, 2133.
Van Dyke, Sir Anthony, 3019.
Van Dyke, Gornelius, 387, 2657.
Van Dyke, Henry Jackson, 3020.
Vane, Sir Henry, 3020.
Vane, Sir Henry, 3020.
Van Eyck, Jan, 2081.
Van Hise, Charles Richard, 3020.
Vanhomrigh, Hester, 2791.
Vanilla, 3020, 2048, 2984.
Van Rensselaer, Killian, 3021, 2926.
Van Rensselaer, Stephen, 3021.
Van Twiller, Wouter, 1959.
Van Wart, Isaac, 99.
Van Wert, Ohio, 3021.
Van Wyck, Judge Augustus, 2447. Van Wyck, Judge Augustus, 2447. Vapor. See Evaporation, 952. Varicose Vein, 3021, 3026. Variety, 3021; genus, 1111. Variola, 2655. Varna, Bulgaria, 3021, 401. Varnish, 3022, 1528. Varnish Tree, 1528. Varro, Marcus, 3022, 914, 1248, 2445. Varus, Defeat of, 148, 248, 2444. Varus, Publius, 3022, 148, 1130, 2444. Vasa, Gustavus, 2788. Vascones, 1909. Vase, 3022, 2295. Vaseline, 3022. Vashti, 938.

Vassar, Matthew, 3022, 3023. Vassar College, 3023, 2297. Vatican, 3023, 646, 1583, 2441. Vatican, Council of, 3023, 2228, 2273. Vauban, Sébastian de, 1036. Vaudeville, 3023, 409.
Vaudeville, 3023, 409.
Vaudois. See Waldenses, 3071.
Vaughan, Benjamin, 558.
Vaughan, Herbert, 3024.
Vault, 3024: arch, 130.
Vauxhall, 3024. Veal, 511; nutrition of, 2009. Vecht, I. Vedas, 3024, 357. Veddas, or Veddahs, 3024. Vedder, Elihu, 3024. Vedder, Elihu, 3024. Vedder, Henry Clay, 3024. Vedic Hymns, 2523. Vega Carpio, Lope Felix de, 3025, 826. Vegetable, 3025, 2234, 2292. Vegetarianism, 3025; food, 1027. Veii, Rome, 3025, 942. Veientine War, 448. Vein, 3025, 314, 473, 1275. Vein (geology), 3026, 1795, 2049. Velásquez, Diego de, 721, 683, 1264 Velásquez, Diego Rodriguez, 3026. Vellum, 2104. Vellum, 2104. Velocipede, 3026; bicycle, 290; tricycle, 2919. Velocity, 3026, 849, 973, 1030. Velvet, 3026, 2240; velveteen, 3026. Venable, Charles Scott, 3027. Venable, W. H., 3253. Venable, W. H., 3253.
Venation, 1555; circulation, 585; sap, 2527.
Vendetta, 3027, 2530, 2627.
Veneering, 3027, 1678, 2451.
Venetia, 1620, 3043; Venetians, 3029.
Venezuela, 3027, 129, 602.
Vengerov, S., 2470.
Venice, Gulf of, 3029.
Venice, Italy, 3029, 1421.
Venison, Nutrition of, 2009.
Venner, Elsie, 88, 1313.
Ventilation, 42, 1352.
Ventriloquism, 3029.
Venus, 3030, 174, 2231.
Venus (goddess), 3030, 23, 725.
Venus, Transits of, 2910.
Venus's Flower Basket, 3030.
Venus's Flytrap, 3030, 487. Venus's Flower Basket, 3030. Venus's Flytrap, 3030, 487. Vera Cruz, Mexico, 3030, 392. Veragua, Don Christobal, 3031. Verb, 3031, 2117. Verbena, 3031; Oil of, 3031. Verdi, Giuseppe, 3031, 2041; Verdigris, 13. Verdun, France, 3031. Vereshchagin, Vasili, 3031, 2473. Verga Giovanni, 3032. Verga, Giovanni, 3032. Vergil. See Virgil, 3053. Vergil. See Vircit. 3053. Verlaine, Paul. 3032. Vermejo, or Bermejo, River. 3032, 327. 2101. Vermes, or Worms. See Worms. 3184. Vermiform Appendix, 3032, 120, 1398. Vermilion, 3032, 584, 2081. Vermilion Iron Range, 1283, 1410, 1800. Vermont, 3032, 1021, 2978. Vermont, University of, 3034, 410. Verne, Jules, 3034. Vernet, Claude Joseph, 3034. Vernet, Jean Émile, 3035, 3037. Vernier, 3035.

Vernon, Edward, 3035. Vernon, Mount, 1863, 3035, 3096. Verona, Italy, 3035, 582; cathedral, 3035. Veronica, Paul, 3036. Veronica, Saint, 3036. Verrazano, Giovanni, 3036, 1681, 1958. Verres, 3036, 580. Verrill, Addison Emery, 3036. Verrocchio, Andrea del, 2570, 3050. Verrocchio, Andrea del, 2570, 3050.
Verschio, Andrea del, 2570, 3050.
Versailles, France, 3036, 3152.
Verse, 3037, 2411.
Vertebrata, 3037, 105, 1115, 3225.
Vertical Writing, 3188.
Vertigo, or Dizziness, 3037.
Vertumnus, 3037, 2266.
Verviers, Belgium, 3037, 266.
Vesalius, Andrew, 329, 2781.
Vespasian, Titus Flavius, 3038, 815, 2444.
Vespers, 1676; breviary, 368.
Vespucci, Amerigo, 3038, 1016, 3028.
Vest, George Graham, 3038.
Vesta, 3039; asteroid, 171.
Vestal Virgins, 3039.
Vesuvius, 3039, 1291, 2267, 3061.
Vetch. See Tare, 2818.
Veterinary, 3040.
Veto, 3040, 2306.
Veuillot, Louis Fugene, 3040.
Vevay, or Vevey, Switzerland, 3040.
Viaduct, 3041; bridge, 371.
Via Mala, 3041. Via Mala, 3041. Vianney, Jean B., 3243. Viaud, Louis Marie Julien, 3041. Viburnum, 3041. Vicar, 3041. Vicar; 3041.
Vicar of Wakefield, 920, 1162.
Vicenza, Italy, 3041.
Vice Presidents, List of, 2976.
Vichy, France, 3041.
Vicksburg, Fall of, 1180.
Vicksburg, Miss., 3042, 1809, 2614.
Vicksburg Campaign, 3042.
Victor (popes), 3042, 2273.
Victor, Colo., 3042.
Victor Emmanuel II., 3042, 1423, 2530.
Victor Emmanuel III., 3043, 1336.
Victoria (plant), 3045. Victor Emmanuel 111., 3043, 1336. Victoria (plant), 3045, 192, 1752. Victoria, Australia, 3043, 192, 1752. Victoria, British Columbia, 3043, 3017. Victoria, Tex., 3043. Victoria I., 3045, 53, 922, 1377. Victoria Cross, 3046. Victoria Falls, 3046, 3215. Victoria Land, 110, 2251. Victoria Nyanza Lake, 3046, 31, 378, 47 Victoria Nyanza, Lake, 3046, 31, 378, 473. Victoria River, 667. Victoria Tower, 2065. Vicuña, 3046, 1612. Vienna, Austria-Hungary, 3046; library, 15 3047; siege of, 2674; university, 2997, 3048. Vienna, Congress of, 3048. Vienna, Treaty of, 3070. Vienna, University of, 3048, 2997. Vieuxtemps, Henri, 3048. Vigfússon, Gudbrand, 3048. Vignaud, Henry, 3048. Vignemale, Mont, 1045. Vigny, Alfred, 3048, 1048. Vikings, 1994, 2546, 3051. Vilas, William Freeman, 3048. Vilayets, or Governments, 2942, 3220.

Villafranca, Italy, 3049. Villafranca, Treaty of, 1423, 1897, 3049. Villari, Pasquale, 3049. Villari, Pasquale, 3049.
Villari, Claude Louis, 3049, 1686.
Villein, 3049, 2590.
Villeneuve, Pierre, 1920, 2908.
Villeroy, Marshal, 2372.
Villi, 3049, 1389.
Villia Busia, 2040. Vilna, Russia, 3049. Vina del Mar, Insurrection of, 3014. Vincennes, Ind., 3050. Vincent, John Heyl, 3050, 544. Vincent of Beauvais, 914.
Vincei, Leonardo da, 3050, 2081.
Vine. See Grape, 1181.
Vinegar, 3050, 13, 15, 121, 1317.
Vinland, or Wineland, 3051, 1995.
Vinton, Alexander Hamilton. Vinton, Alexander Hamilton, 3051. Viol, 3051. Viol, 3051, 1021. Violet, 3051, 401, 1010, 1205. Violoncello, 3052, 1010. Viper, 3052, 2663; adder, 20. Virchow, Rudolf, 3052, 910. Virenow, Rudolf, 3052, 910. Vireo, or Greenlet, 3053, Virgil, 3053, 306, 797, 2245. Virginia, 3054, 649, 2978. Virginia, Minn., 3056. Virginia City New 3056, 10 Virginia, University of, 3056.
Virginia City, Nev., 3056, 1931.
Virginia Creeper, 3057, 1426, 3177.
Virginia Military Institute, 1580.
Virgini Islands, 3057, 1562, 2984.
Virginius, Lucius, 3057, 120.
Virginius Massacre, 3057.
Virgin Mary, 1314, 1453, 1671, 1720, 2438.
Virgin Queen, The, 3056.
Virgo, the Virgin, 3223.
Virus, 3057, 3009.
Visaya Language, 2191.
Vischer, Peter, 2570. Visaya Language, 2191.
Vischer, Peter, 2570.
Vise, 3057, 2567.
Vishnu, 3057, 357.
Visible Speech, 3057.
Visigoths. See Goths, 1170.
Vision. See Eye, 961.
Vision of Sir Launfal, The, 1640.
Vistula River, 3058, 1125, 2247.
Visual Sensation, 3058.
Vitascope. or Kinetoscope, 1508. Vitascope, or Kinetoscope, 1508. Vitellius, 3038. Vitellius, 3038.
Vitepsk, or Vitebsk, Russia, 3058.
Vitoria, Battle of, 3058, 988, 2679, 3120.
Vitoria, or Vittoria, Spain, 3058.
Vitrified Brick, 370.
Vitriol, 670, 2772.
Vivisection, 3058.
Vizier, or Vizir, 3058, 2942.
Vladimir, 3059, 2470.
Vladivostok, Asiatic Russia, 3059, 2626. Vladimir, 3059, 2440. Vladivostok, Asiatic Russia, 3059, 2626. Vocal Cords, 1545, 3059; Vogel, Julius, 3059. Vocational Schools, 873, 2554. Vogler, George Joseph, 3059. Vogt, Carl, 3059. Voice, 3059, 974, 2198, 2934. Voitus, Vincent, 1040. Volter, 3039, 974, 2198, 2934. Volture, Vincent, 1048. Volapük, 3060, 937. Volcano, 3060, 686, 942, 1266, 1277, 1507, 1550, 2267, 2275, 3039. Vole, 3061; field mouse, 1864. Volga Piver, 2061, 2405 Volga River, 3061, 2425.

Volks-schulen, 2554.
Volmer, Melchior, 287.
Volsci, or Volscians, 677.
Volsci, 3061, 594, 891, 2962.
Volta, Alessandro, 3061, 643, 891, 1090.
Voltaic Battery, 892, 1090.
Voltaic Pile, 1090.
Voltaic Pile, 1090.
Voltaire, François, 3062, 1048.
Volterra, Daniele de, 2081.
Volunteer, 3062, 897.
Volunteer, 3062, 589.
Volunteers of America, 3063, 2510.
Vomiting, 3063, 2575.
Von Baer, Karl Ernst, 910.
Vondel, Joost van den, 826, 1927.
Vonnoh, Robert William, 3063.
Voorhees, Daniel Woolsey, 3063.
Voornej, or Voronezh, Russia, 3063.
Vororoej, or Voronezh, Russia, 3063.
Vorticella, 3064; infusoria, 1387.
Vosses Mountains, 3064, 1045.
Voss, Johann Heinrich, 3064.
Vots, 3064, 193, 218, 2112, 2768.
Voting Machine, 3064.
Vote, 3064, 193, 218, 2112, 2768.
Voting Machine, 3064.
Vowel, or Vocal, 3065, 1, 852, 1355, 2011, 2955
3067, 3198.
Vulcan, 3065, 14, 3030.
Vulcan (astronomy), 174, 2231.
Vulgate, 3065, 288, 1450.
Vulpius, Christian August, 3065.
Vulture, 3065, 648, 1535.
Vychegda River, 848.

W

W, 3067, 2951.
Wabash, Ind., 3067.
Wabash River, 3067, 1378, 2022.
Wacht am Rhein, Die, 3067, 1903.
Waco, Tex., 3067, 2853.
Wadai, 3067, 2767.
Wade, Benjamin Franklin, 3068.
Wade, Decius S., 3068.
Waders (grallatores), 298.
Wadsworth, James Samuel, 3068.
Wadsworth House, 444.
Wager, 3068.
Wager, 3068; labor, 1525.
Wagner, Adolph, 3069.
Wagner, Johann, 981.
Wagner, William Richard, 3069, 1879, 2041.
Wagner, William Richard, 3069, 1895.
Wagtail, 3070, 723, 3080.
Wahabis, 3070.
Wahabis, 3070.
Wahpeton, N. D., 3070.
Waite, Morrison Remich, 3070.
Wake, 3070.
Wake, 3070.
Wake-Robin, 3070.
Wake-Robin, 3070.
Walcheren, Island, 3070.
Walcheren, Island, 3070.
Walcheren, Island, 3070.
Walcott, Charles Doolittle, 486, 2661.
Waldemar II., of Denmark, 783.
Waldemar III., of Denmark, 783.
Waldenses, 3071.

Waldo, Peter, 3071. Wales, 3071, 917, 1151, 1186. Wales, Prince of, 3072. Wales, Prince of, 3208, 2311. Walfisch Bay, 3072, 468, 1124. Walhalla, 3072, 2019, 3012. Walker, Amasa, 3072. Walker, Francis Amasa, 3073. Walker, Frederick, 3073. Walhalla, 3072, 2019, 3012.
Walker, Amasa, 3073.
Walker, Francis Amasa, 3073.
Walker, Frederick, 3073.
Walker, Robert James, 3073, 2820.
Walker, Robert James, 3073, 2820.
Walker, William, 3073, 1998.
Walking Stick, 3073, 1793.
Walkyries, 3072.
Wall, The Great, 568, 569, 1525.
Wallaby, 2823.
Wallace, Idaho, 3073, 1362.
Wallace, Alfred Russell, 3074, 297, 757.
Wallace, Lewis, 3074.
Wallace, Sir William, 3074, 877, 2564.
Wallace, Sir William, 3074, 877, 2564.
Wallachia, 739, 2462; Wallachians, 1339.
Wallack, John Lester, 3075.
Wallachia, Wash., 3075, 3095.
Wallenstein, Albrecht, 3075, 987, 1222, 1648.
Waller, Edmund, 3075.
Wallingsford, Conn., 3075.
Walloons, 3076, 354, 2879.
Wall Paper, 2099.
Walnut, 3076, 2008, 2025.
Walpole, Sir Robert, 3076, 493, 1116, 2224.
Walpole, Sir Robert, 3076, 493, 1116, 2224.
Walpurgis, or Walpurga, 3076.
Walpurgis Night, 3077.
Walrus, 3077, 1425.
Walsall, England, 3077.
Walrus, 3077, 1425.
Walsall, England, 3077.
Walter, of Scotland, 2762.
Walter, Thomas Ustick, 3077.
Walter, George, 2995.
Walther, Carl Ferdinand, 3078, 84.
Walther, Reuben Hyde, 3079.
Walworth, Robert Hyde, 3079.
Wandering Jew, 3079, 1730, 2184.
Wampanoag, 3079, 1730, 2184.
Wampanoag, 3079, 1730, 2184.
Warpanoag, 3079, 1730, 2184.
Warpa War, Declaration of, 653, 296. War, Declaration of, 653, 2986. War, Department of, 425, 2991. Warbeck, Perkin, 3080. Warblers, 3080, 318, 2429. Ward, Artemas, 3081, 80, 2327. Ward, Artemas, 3081.
Ward, Antemus, 3081, 89, 2327.
Ward, Elizabeth Stuart Phelps, 2181.
Ward, Gen. F. T., 2809.
Ward, Henry Augustus, 3081.
Ward, John Quincy, 3081, 2570.
Ward, Lester Frank, 3081.
Ward, Mary Augusta Arnold, 3081.
Wardlaw, Jane, 2602. Wardlaw, Jane, 2602. Ware, Mass., 3082. Ware, William, 3254. Warfield, David, 265. War Game, or Kriegs Spiel, 3089. Waring, George Edwin, 3082.

10

K

de

H

Warming and Ventilation, 3082, 2362. Warner, Charles Dudley, 3083, 89. Warner, Seth, 3083, 715. Warner, Susan, 3083, 2327. War of 1812, 3083, 1654, 1671, 2162, 2980. Warp, or Chain, 1627, 3112. Warrant, 3085; search warrant, 3085. Warranty, 3085, 771. Warren, Ohio, 3085. Warren, Pa., 3085. Warren, R. I., 3086. Warren, Gouveneur Kemble, 3086, 3147. Warren, Joseph, 3086. Warren, Lavinia, 847. Warren, William Fairfield, 3086. Warren, William Fairfield, 3086. Warrensburg, Mo., 3086, 1520, 2470. Warsaw, Russia, 3086, 1520, 2470. War Ship, 3087, 148, 1698, 1911. Wars of the Roses, 346, 2451. Wartburg, 3088, 846. Warthe River, 3088, 2019. Wart Hog, 3088. Warton, Thomas, 1548. Warwick, R. I., 3088, 2409. Warwick, Richard Neville, 3088, 2451. Wasatch Mountains, 2966, 3005. Washburn, Wis., 3088. Wasatch Mountains, 2966, 3005.
Washburn, Wis., 3088.
Washburn, Cadwallader Colden, 3089.
Washburne, Elihu Benjamin, 3089.
Washburne, William Drew, 3089, 2215.
Washington (State), 3093, 1021, 2978.
Washington, D. C., 3090, 804, 2974.
Washington, Ind., 3089.
Washington, Iowa, 3089.
Washington, Pa., 3089.
Washington, Booker Taliaferro, 3095, 47.
Washington, George, 3096, 85, 1103, 1863, 2976, 2979. 2979. 2979.
Washington, Lawrence, 3035, 3096.
Washington, Martha, 3097, 731, 3096.
Washington, Mount, 1940, 1987.
Washington, Treaty of, 3097.
Washington, University of, 3097, 3095.
Washington and Lee University, 3097, 1580.
Washington and Jefferson College, 3089.
Washington Arch, 3097.
Washington Court House, Ohio, 3097.
Washington Elm, 3098.
Washington Monument, 3098, 2013, 3091. Washington Edirt House, Onio, 3097.
Washington Elm, 3098.
Washington Monument, 3098, 2013, 3091.
Washington of South America, 327.
Washington's Birthday, 129, 1311.
Washington University, 3098, 2496.
Washita, 3098, 1634, 2386.
Wasp, 3098, 258, 1323.
Watauga Association, 3099, 2429.
Watch, 3099, 901, 3100.
Water, 3099, 901, 3100.
Water, 3099, 1275, 2571.
Water, Evaporation of, 606, 952, 3100.
Water Bug, 3100.
Water Bug, 3100.
Waterbury, Conn., 3100, 606.
Water Colors, 3100, 2212.
Waterfall, or Cataract, 3101, 743, 1967.
Waterfall, or Chignon, 1234.
Water Flea, 752.
Water Glass, or Soluble Glass, 3101.
Water Hen, 2365.
Waterhouse, Alfred, 3101. Water Fieh, 2505.
Waterhouse, Alfred, 3101.
Water Lily, 3102; lily, 1592.
Waterloo, Belgium, 3102.
Waterloo, Iowa, 3102, 515.
Waterloo, Battle of, 3102, 248, 267, 1896, 3120.
Watermelon. See Melon 1753.

Water Meter, 3102, 3104. Water Polo, 3103. Waterproofing, 3103, 1384.
Waterproofing, 3103; storms, 2752.
Watertown, Mass., 3103.
Watertown, N. Y., 3103, 1958.
Watertown, S. D., 3103, 2691.
Watertown, Wis., 3103, 3169.
Watertown, Wis., 3104, 1681.
Waterville, Me., 3104, 1681.
Waterville, N. Y., 3104, 2602.
Water Wheel. See Wheel, 3134.
Waterworks, 3104, 1871.
Watkins, Charles F., 3252.
Watling's Island, 636.
Watson, Henry Brereton Marriott, 3104.
Watson, John, 3105, 2327.
Watson, John Crittenden, 3105.
Watson, Richard, 3248.
Watson, Thomas Edward, 3105.
Watt, 893, 894. Waterproofing, 3103, 1384. Watt, 893, 894. Watt, James, 3105, 687, 2735. Watterson, Henry, 3106. Wattletree, 11. Wattlefree, 11.
Watts, George Frederick, 3106.
Watts, Isaac, 3106, 1353.
Watt Tyler, 3106, 2413.
Waukegan, Ill., 3106.
Waukegan, Ill., 3106, 3169.
Waukesha, Wis., 3107, 3107.
Wave, 3107, 858, 2572, 2876.
Wave Motion: ether, 939; heat, 1275; light, 1587; sound, 853, 2676; water, 2572.
Wax, 3107, 259, 461.
Waxahachie, Texas, 3108.
Wax Palm, 3108, 2089; Wax Plant, 3108.
Waxwing, 3108.
Waycross, Ga., 3108.
Waycross, Ga., 3108.
Wayland, Francis, 3108, 875.
Wayne, Anthony, 3108, 1039, 2751.
Waynesboro, Pa., 3109.
Wealth, 3109, 1525, 2254.
Weasel, 3109, 990, 2252, 2649.
Weather Bureau, 3110, 235, 1769, 2633, 2753.
Weatherford, Tex., 3111.
Weaver, James Baird, 3111, 2155.
Weaver Bird, 3111, 250. Weaver, James Baird, 3111, 2155. Weaver Bird, 3111, 250. Weaving, 3112, 1627. Webb, Alexander Stewart, 3112.
Webb, James Watson, 3112, 3136.
Webb, Matthew, 2791.
Webb, Sidney, 3112.
Webb City, Mo., 3113.
Weber, Carl Maria, 3113, 1130, 1395, 1879. Webster, Mass., 3113, 87, 3248, 3249, 3251. Webster, Noah, 3114, 797. Webster-Ashburton Treaty, 161, 3114. Webster-Ashburton Treaty, 161 Webster City, Iowa, 3115. Wedge, 3115, 1746. Wedgwood, Josiah, 3115, 2295. Wedgwood Ware, 3115. Wednesday, 3115, 3116, 3173. Weed, Thurlow, 3115. Weeds, 3115, 615, 1867, 2864. Week, 3116; month, 1839. Weeping Elm, 906. Weeping Willow, 3155. Weever, or Stingfish, 3116. Weevil, 3116, 1394. Weidner, Revere Franklin, 3116. Weigelia, 3117.

Weighing Machine, 3117, 213, 2899. Weight, 119, 1184, 1577, 1770, 2298. Weights and Measures, 3117. Weimar, Germany, 3118, 2549. Weir, Harrison William, 3118. Weir, Robert Walter, 3118. Weisenthal, Charles F., 2599. Weismann, August, 3118. Weisenthal, Charles F., 2599.
Weismann, August, 3118.
Weiss, Prof., of Berlin, 1794.
Welding, 3118, 895; solder, 2672.
Well, 3119, 155, 1414.
Welland Canal, 459, 2494, 3119.
Welland River, 3119. Welles, Gideon, 3119.
Welles, Gideon, 3119, 1729.
Wellesley, Mass., 3119, 1729.
Wellesley, Richard Colley, 3119, 3120.
Wellesley College, 3120, 1729.
Wellington, New Zealand, 3120, 1966.
Wellington, Duke of, 3120, 1896, 2678, 3102.
Wellman, Walter, 3121, 218, 2251.
Wells, David Ames, 3121 Wells, David Ames, 3121. Wells, Ohio, 3121. Welsh, 518, 3072. Wellsville, Ohio, 3121. Welsvinc, Olio, 3121.
Welsvinc, 3121.
Wenceslaus IV., 1921.
Wendis, or Wendic, 2248, 2652.
Wener, Lake, 3121, 2786.
Wentworth, John, 755.
Wentworth Military Institute, 1579.
Werder, August, 3122.
Wergeland, Henrik Arnold, 1999. Wergeland, Henrik Arnold, 1999. Werner, Abraham G., 1114, 1795. Werner, Reinhold von, 3122. Werwolf, or Werewolf, 3122. Weser River, 3122, 367, 1125. Wesley, Charles, 3122, 1353, 1769. Wesley, John, 3122, 1769. Wesleyan University, 3123, 656, 1783. Wessex, 879, 1289. Wessex, 8(9, 1289.
West, Benjamin, 3123, 353, 2131.
West Appomattox, Va., 122.
West Bay City, Mich., 3123, 1780.
Westboro, Mass., 3123.
Westbrook, Me., 3123, 1681.
West Chester, Pa., 3123.
Westerley, R. I., 3123, 2409.
Western Australia, 3124, 191, 192.
Western College, 2071. Western Rustrana, 3124, 191, 192.
Western College, 2071.
Western Islands, or Hebrides, 1277.
Western Reserve, 601, 1096, 2024.
Western Reserve University, 3125, 601, 2024. Western Reserve University, 3125, 601, 2024. Western University of Pennsylvania, 71. Western Theological Seminary, 71. Westfield, Mass., 3125. Westfield, N. J., 3125. West Flanders, 266, 1011. West Haven, Conn., 3125. West Hoboken, N. J., 3125. West Indies, or Antilles, 3126, 113, 2982; Bahama, 210; Barbados, 228; Bermuda, 282; Cuba, 113, 719; Curaçoa, 725; Danish, 750; Greater Antilles, 113; Hayti, 1271; Isle of Pines, 2218; Jamaica, 1433; Leeward Islands, 1562; Lesser Antilles, 113; Martinique, 1719; Porto Rico, 2282; Saint Thomas, 2501; Trinidad, 2920; Virgin Islands, 3057; Windward Islands, 3161. Islands, 3161. Westinghouse, George, 3127, 42. Westlake, J. W., 3239. Westminster Abbey, 3127, 133, 1622. Westminster Hall, 3127.

Westminster School, 1622.
West New York, N. J., 3127.
West Orange, N. J., 3127.
Westphalia, 3128, 388, 919, 2325.
Westphalia, Treaty of, 1011, 1131, 3128.
West Pittston, Pa., 3128.
West Point, N. Y., 3128, 428, 1332.
West Springfield, Mass., 3128.
West Virginia, 3128, 1021, 2978.
West Virginia, University of, 3130.
Wetherell, Elizabeth. See Warner, Susan, 3083.
Wetterhorn Mountain, 3130.
Weyler, Nicolau Valeriano, 3130, 722. Weyler, Nicolau Valeriano, 3130, 722. Weyman, Stanley John, 3131. Weymouth, Mass., 3131.
Weymouth, Mass., 3131.
Weyprecht, Admiral, 2249.
Whale, 3131, 81, 524, 2705.
Whalebone, or Baleen, 3132.
Whangho. See Hoang-ho, 1308.
Wharf, 3132, 1251. Wharton, Edith, 3132, 920. Whatton, Francis, 3132. Whately, Richard, 3133, 107, 1619, 3238. Wheat, 3133, 565, 1019, 2009, 2468. Wheat Midge, 3134. Wheat Moth, 1860. Wheat Moth, 1600.
Wheaton, Henry, 3134.
Wheaton, Loyd, 3134.
Wheatstone, Sir Charles, 3134, 645, 2740.
Wheel, 3134, 2937; cam, 443.
Wheel and Axle, 3135, 1746. Wheeler, Benjamin Ide, 3135.
Wheeler, Benjamin Ide, 3135.
Wheeler, Joseph, 3135, 816.
Wheeler, William Almon, 3136, 2976.
Wheeling, W. Va., 3136, 3130.
Whetstones, 8, 2518, 2364.
Whey, 545, 1787.
Whig, 3136, 512, 1259, 2829, 2976; English, 512.
Whighat, 541. Whig, 3136, 512, 1259, 2829, 2976; English, Whinchat, 541.
Whipple, Abraham, 3137.
Whipple, Edwin P., 89.
Whipple, Henry Bennington, 3137.
Whipple, William, 2995.
Whip-Poor-Will, 3137, 1974.
Whirlpool, 3137, 1672, 1968.
Whirlpool, 3137, 1672, 1968.
Whirlpool Rapids, 466, 1968.
Whirlwind, 3137, 2621; cyclone, 734.
Whiskers, 253; mustache, 1234.
Whisky, 3138, 57, 2478.
Whisky Insurrection, 3138, 1065, 1560, 1578.
Whisky Ring, 3138.
Whispering, 3060.
Whist, 3138, 482.
Whistler, James Abbott McNeill, 3138. Whist, or James Abbott McNeill, 3138. Whitby, England, 3138. White, Andrew Dickson, 3139, 486, 875. White, Edward Douglass, 3139, 486. White, Emerson Elbridge, 3139. White, Engrange 2690. White, Sir George, 2680. White, Gilbert, 3139. White, Henry Kirke, 3139. White, Horace, 3139. White, Hugh Lawson, 3139. White, John, 753. White, Perry, 596. White, Richard Grant, 3140, 89. White, Stanford, 1665. White, Stewart Edward, 3140. White, Stewart Edward, 5140.
White, Susanna, 3164.
White, William, 3140.
White, William Allen, 3140.
White Ants, or Termites, 109, 2846.

Whitebait, 3140. White Caps, 3140. White City, 3184. Whitefield, George, 3140. Whitefish, 3141, 1006. White Friars, 485.
Whitehead, William, 1548.
Whitehorse Rapids, Alaska, 50.
White Horse River, 1514. White House, 3141, 3092.
White Lady, 3141.
White Lead, 3141, 1554, 2081.
White Mountains, 3141, 119, 1940.
White Disk, 2011. White Pine, 2218. White Plains, N. Y., 3142. White River, 3142. White River, 3142, 1378. White Sea, 3142, 2467. Whitewash, 527; lime, 1593. Whiting, 3142. Whiting, 3142. Whitman, Mass., 3142.
Whitman, Charles Otis, 3142.
Whitman, Walt, 3142, 88.
Whitmarsh, A. N., 3248.
Whitney, Asa, 3143.
Whitney, Asa, 3143. Whitney, Asa, 3143. Whitney, Eli, 3143, 687, 1239. Whitney, Eli, 3143, 687, 1239.
Whitney, Mount, 438.
Whitney, William Collins, 3143.
Whitney, William Dwight, 3144.
Whitsuntide, or Pentecost, 119, 160, 979.
Whittier, John Greenleaf, 3144, 87, 88, 1265.
Whittington, Sir Richard, 3144.
Whooping Cough, 3144, 1283.
Whortleberry, 3145, 1331. Whooping Cough, 3144, 1283.
Whortleberry, 3145, 1331.
Whydah, Dahomey, 741.
Wichern, Johann Heinrich, 3145, 2378.
Wichita, Kans., 3145, 1490.
Wichita Indians, 3145.
Widgeon, 3145; gadwall, 1083.
Wied, Herman of, 536, 903.
Wieland, Christoph, 3145, 1129, 2245, 2535.
Wiesbaden, Germany, 3145, 1297 Wiesbaden, Germany, 3145, 1297. Wigan, England, 3146. Wiggin, Kate. See Riggs, 2421. Wight, Isle of, 3146, 920. Wigwam, 3146; kivas, 1382. Wilberforce, Robert, 3246. Wilberforce, Samuel, 3146. Wilberforce, William, 3146. Wilbur, John, 2345. Wilcox, Ella Wheeler, 3146, 89. Wild Cat, 3147, 509; lynx, 1650. Wilde, Oscar Fingal, 3147. Wilde, R. H., 86. Wilde, R. H., 86.
Wilderness, Battles of the, 3147, 591, 1180, 1561.
Wilhelmina, Caroline, 1116.
Wilhelmina, Helena Paulina, 3147, 1927.
Wilhelmshöhe, 1897, 2578.
Wilkes, Charles, 3148, 1117, 2653, 2916.
Wilkes, Charles, 3148, 2151.
Wilkes, Sir David, 3148.
Wilkesbarre, Pa., 3148, 2151.
Wilkie, Sir David, 3148.
Wilkinsburg, Pa., 3149.
Wilkinson, Henry Spenser, 3149.
Wilkinson, James, 1054, 3149.
Will, 3149, 2317.
Will (mental science), 3150, 1396, 1793, 2328. Will (mental science), 3150, 1396, 1793, 2328. Willamette River, 3150, 944, 2049. Willamette University, 2051, 2504. Willard, Emma Hart, 3150, 1239.

Willard, Frances Elizabeth, 3150. Willemstad, Curaçoa, 726. Willemsvaart, Canal, 3228. William, Prince of Orange, 3150, 881, 1927.
William I., of England, 3151, 550, 922, 2564.
William II., of England, 3151, 922.
William III., of England, 3151, 922, 1723, 2565.
William IV., of England, 3152, 922, 3045.
William I., of Germany, 3152, 1059, 1132, 3037.
William II., of Germany, 3153, 301, 1132.
William I., of Württemberg, 3190.
William and Mary College, 3153, 3056.
William Henry, Fort, 1835. William and Mary College, 3153, 3056.
William Henry, Fort, 1835.
William of Montferrat, 2938.
William of Weid (born in 1872), 51.
Williams, David, 99; Williams, General, 247.
Williams, George, 3211.
Williams, James, 1501.
Williams, John, 3153.
Williams, John Sharp, 3153.
Williams, John Sharp, 3153.
Williams, Roger, 3153, 85, 228, 2409.
Williams, Samuel Wells, 3154.
Williams, William, 2995.
Williams, William, 2995.
Williamsburg, Va., 3154, 1134.
Williamsburg Bridge, 381, 861, 1962.
Williamson, Hugh, 2989.
Williamson, Hugh, 2989.
Williamson, Hagh, 2989.
Williamstown, Mass., 3154.
Williamstown, Mass., 3154.
Williamstown, Mass., 3154.
Willioughby, Hugh, 2249, 2712.
Willow, 3155, 242.
Willson, T. L., 13.
Wilmington, Del., 3155, 775.
Wilmington, Del., 3156, 1992.
Wilmot, David, 3156, 2258.
Wilmot Proviso, 2258, 3156.
Wilson, Alexander, 3156.
Wilson, Allan B., 2599.
Wilson, Mrs. Cornwall B., 3238.
Wilson, James, 3157. William Henry, Fort, 1835. Wilson, Allan B., 2599.
Wilson, Mrs. Cornwall B., 3238.
Wilson, Henry, 3156, 2976.
Wilson, James, 3157.
Wilson, James, 3157, 2989, 2995.
Wilson, James Grant, 3157.
Wilson, James Harrison, 3157.
Wilson, John, 3157, 2327.
Wilson, John, 3158.
Wilson, John Moulder, 3158.
Wilson, William Lyne, 3158; William B., 3158.
Wilson, William Lyne, 3158; William B., 3158.
Wilson, Woodrow, 3158, 780, 2261, 2399, 2807.
Wilson's Creek, Battle of, 1651.
Wilson's Snipe, 2664.
Wilson Tariff, 2820, 3158.
Winchell, Alexander, 3158.
Winchell, Alexander, 3158.
Winchester, Ky., 3159.
Winchester, Mass., 3159.
Winchester, Va., 3159, 2612.
Winckelmann, Johann Joachim, 3159.
Wind, 3159, 101, 442, 734, 1832, 2639, 2643; norther, 1994; northwester, 1996.
Winder, William Henry, 3160.
Winder, William Henry, 3160.
Windlass, 3160, 3135; Windmill, 3160, 1925.
Window, 348, 1124.
Windlass, 3160, 3135; Windmill, 3160, 1925.
Window, 3161, 133, 1150, 1777.
Windows, Glass for, 1149, 1416.
Wind River Mountains, 2434, 3191.
Windsor Canada, 3161, 2040.

Windsor, England, 3161, 2854. Windsor Castle, 3161. Windward Islands, 3161, 1562. Wine, 3162, 57, 360, 1181, 2890. Winebrenner, John, 3162, 84. Winfield, Kans., 3162. Winged Lion, 3162. Winged Lion, 5162.
Winkelried, Arnold von, 3163, 2796.
Winnebago, Lake, 3163, 3167.
Winnebagoes, 3163, 742.
Winnipeg, Canada, 3163, 1696.
Winnipeg, Lake, 3163, 516, 866, 1695.
Winnipegosis, Lake, 3164, 1695. Winnipegosis, Lake, 3164, 1695. Winnipiseogee, Lake, 3164, 1941. Winona, Minn., 3164, 1802. Winslow, Edward, 3164. Winslow, John Ancrum, 3164. Winsor, Justin, 3165, 88. Winsted, Conn., 3165. Winston, N. C., 3165, 1992. Winter, 3165, 856, 1298, 2575, 3223. Winter, William, 3165. Wintergreen, 3165, 2117 Wintergreen, 3165, 2117. Winter Palace, 2499. Winter Palace, 2499.
Winthrop, Mass., 3166.
Winthrop, John, 3166, 85, 657.
Winthrop, Robert Charles, 3166.
Winthrop, Theodore, 3166.
Wire, 3166, 837, 1159, 2637.
Wireless Telegraphy, 2836, 1705, 2835.
Wireworm, 3167, 602.
Wirt, William, 3167, 2257.
Wirtz, Henry, 98.
Wisconsin, 3167, 209, 2978.
Wisconsin River, 3169, 1807.
Wisconsin, University of, 3169, 1670. Wisconsin, 5107, 203, 2376.
Wisconsin River, 3169, 1807.
Wisconsin, University of, 3169, 1670.
Wisdom of Solomon, 118, 289.
Wise, Henry Alexander, 3170.
Wiseman, Nicholas Patrick, 3170.
Wissmann, Hermann von, 3170, 1053.
Wistaria, 3170.
Wister, Owen, 3170.
Witcheraft, 3171, 1674, 2503.
Witcheraft, 3171, 1674, 2503.
Witches, 2503, 3077, 3171.
Witch-Hazel, or Wych Hazel, 3171.
Witch-Hazel, or Wych Hazel, 3171.
Witnespoon, John, 3172, 2995.
Witness, 3172, 771, 3149.
Witte, Sergius, 3172, 2472, 2474.
Wittelbach, Count of, 249.
Wittenberg, Germany, 3172, 1647.
Wittenberg Lutheran College, 2717.
Wittwatersrand, 2912. Wittikind, 2543.
Wittikind, 2543.
Witwatersrand, 2912.
Woad, 3172; dyeing, 849.
Woburn, Mass., 3172.
Woden, 3173, 2019, 3116.
Woermann, Karl, 3173.
Wöhler, Frederick, 3173, 546.
Wolcott, Edward Oliver, 3173
Wolcott, John, 3173, 2327.
Wolcott, Oliver, 2995.
Wolcott, Roger, 3173.
Wolf, 3173, 694, 1427.
Wolf, Christian von, 3174.
Wolfe, Charles, 3174, 3238.
Wolfe, James, 3174, 457, 1836, 2350.
Wolf Fish, 3174; shagreen, 2601.
Wolmar, Melchior, 442.
Wolseley, Sir Garnet Joseph, 3175, 4 Wolseley, Sir Garnet Joseph, 3175, 458. Wolsey, Thomas, 3175, 490, 1287. Wolstand, Saint, 77.

Wolverhampton, England, 3175. Wolverine, or Glutton, 1154. Wolverine State, 1778. Woman's Christian Temperance Union, 3175, 2901. 2901.
Woman's Relief Corps, 3176.
Woman's Rights, 3176, 307, 1614, 3192.
Wombat, 3176, 1717.
Women's Clubs, 3176.
Wood, 199, 231, 1031, 1076, 1644, 2702, 3177.
Wood, Horatio Curtis, 3177.
Wood, Leonard, 3177.
Wood Alcohol, or Methyl Alcohol, 3177, 57.
Woodberry, George Edward, 3177, 89. Wood Alcohol, or Methyl Alcohol, 317 Woodberry, George Edward, 3177, 89. Woodbine, 3177, 1426, 3057. Woodbury, Levi, 3177. Wood Carving, 3177. Wood Charcoal, 533. Woodchuck, 3178, 1712. Woodcock, 3178. Wood Duck, 837. Wood Engraving, 3178, 286, 923. Wooden Horse, 1541, 2925. Woodland College, 1373. Wooden Horse, 1541, 2925.
Woodland College, 1373.
Woodmen of America, Modern, 274.
Woodmen of the World, 274.
Woodpecker, 3179, 298, 1013, 2008.
Wood Pewee, 3179.
Woodruff, Wilford, 3179, 1851.
Woodstock, Ontario, 3180.
Woodward, Calvin Milton, 3180.
Woodward, Robert Simpson, 3180.
Woodworth, Samuel, 86, 826.
Woof, or Weft, 1627, 3112.
Wool, 3180, 1155, 2608.
Wool, John Ellis, 3181.
Woolsey, Theodore Dwight, 3181.
Woolsey, Theodore Dwight, 3181.
Woolwich, England, 3181.
Woonsocket, R. I., 3181, 2409.
Wooster, Ohio, 3182.
Worcester, England, 3182.
Worcester, England, 3182.
Worcester, Mass., 3182, 1729.
Worcester, Howard Somerset, 2734.
Worcester, Joseph Emerson, 3182, 797.
Worden, John Lorimer, 3183.
Word Method, 2380.
Wordsworth, William, 3183, 920, 1548, 2439.
Workhouse, 3183, 2272.
World's Columbian Exposition, 3183, 960.
World's Fairs. See Exposition, 959. Woodland College, 1373. Workhouse, 3183, 2272.
World's Columbian Exposition, 3183, 960.
World's Fairs. See Exposition, 959.
Worm, or Coiled Tube, 57, 804.
Worms, 3184, 858, 2397, 3225.
Worms, Diets of, 3184, 536, 1647.
Worms, Germany, 3184, 1647.
Wormwood, 3184, 9.
Worsted, 3185, 3181 Worsted, 3185, 3181.
Worsted, 3185, 3181.
Wort, 369; sweet wort, 261; lungwort, 1646; honeywort, 3108.
Worth, William Jenkins, 3185.
Wound, 3185, 114, 224, 1094. Wound, 3185, 114, 224, 1094.
Wrangler, 3185, 3185.
Wrath of Achilles, 1316.
Wren, 3185, 1337.
Wren, Sir Christopher, 3185, 576, 3127.
Wrestling, 3186; athletics, 176.
Wright, Carroll Davidson, 3186, 486.
Wright, Horatio Goveneur, 3186.
Wright, John D., 558.
Wright, Luke E., 3187, 2192.
Wright, Orville and Wilbur, 3187, 1024.
Wright, Silas, 3187.

Writ, 3187, 180, 1228, 1389. Writing, 3188, 1389, 2104; runes, 2463. Writs of Assistance, 3189. Wrought Iron, 1410. Wryneck, 3189. Wulfila, or Ulfilas, Bishop, 1170, 2956. Wulfrune, 3175. Wundt, William, 3189. Württemberg, Germany, 3189, 1128. Wurtz, Charles Adolphe, 546. Wurtz, Charles Adolphe, 540.
Würzburg, Germany, 3190, 1125.
Wu Ting Fang, 3190.
Wyandots, or Wyandottes, 3190, 1343, 3218.
Wyandotte, Mich., 3190.
Wyandotte Cave, 3190, 513.
Wyandotte Constitution, 1491. Wyandotte Constitution, 1491.
Wyant, Alexander H., 3190.
Wyatt, Charles, 3112.
Wyatt, Richard James, 3190.
Wyatt, Sir Thomas, 3191, 919.
Wycherley, William, 826.
Wycliffe, John, 3191, 874, 919, 1344.
Wyclif's Bible, 288.
Wyoming, 3191, 1021, 2978.
Wyoming, University of, 3193.
Wyoming Massacre, 3193.
Wyoming Valley, 3193.
Wyss, Johann Rudolf, 3193.
Wythe, George, 3193, 2995.

X, 3194, 2951. Xanthippe, 3194, 2669. Xanthippus, 2392. Xanthus, Asia Minor, 3194, 1648. Xavier, Saint Francisco, 3194. Xebec, 3194; ship, 2616. Xenia, Ohio, 3194. Xenocrates (born 395 B. c.), 2235. Xenocrates (born 395 B. C.), 2235. Xenon (chemistry), 547. Xenophanes (born 569 B. C.), 2195. Xenophon, 3195, 1325, 2915. Xerxes I., 3195, 155, 1572, 2503, 2861. Ximenes, Francisco, 3196. Ximenes de Quesada, Gonzalo, 3196. Xingü River, 3196, 80, 362. Xisuthros, 779. Xolotl, 3196. X-Rays, 3196, 1022, 2363, 2435. X-Rays, 3196, 1022, 2363, 2435. Xuthus, 14. Xylene, 3197, 610, 1892. Xylophone, 3197. X Y Z Correspondence, 3197.

\mathbf{Y} .

Y, 3198, 1355, 2951. Y, or Ij. 3198, 3215. Yablonoi Mountains, 3198, 164, 2625. Yacht, 3198, 1600, 2361. Yachting, 3198, 235, 2361. Yajur Veda. See Vedas, 3024. Yak, 3199, 164. Vakima Indians, 3199. Yakima Indians, 3199. Yakima River, 3199, 3094. Yakub, or Yakub Khan, 5, 29. Yakutat Bay, 50. Yakuts, or Siberian Turks, 2944, 3199.

Yakutsk, Yakutsk, 3199. Yakutsk, 1 akutsk, 0100. Yale, Elihu, 3200. Yale, Linus, 3200, 1614. Yale University, 3200, 1943, 2997. Yalobusha River, 3203. Yalu River, 3200, 1442, 2473. Yam, 3200, 2293. Yamagata, Aritomo, Marquis, 3200. Yambuya, Congo, 159. Yancey, William Lowndes, 3201. Yang-tse-Kiang River, 3201, 779, 2425. Yankee, 3201. Yankee Doodle, 3201, 807. Yankton, S. D., 3201, 2691. Yard (lineal, square and cubic), 1744. Yarkand, Eastern Turkestan, 3201, 2939. Yarmouth, Nova Scotia, 3202, 2003. Yarmouth, Nova Scotia, 3202, 2003.
Yarmouth, or Great Yarmouth, England, 3202.
Yaroslav, Russia, 3202.
Yarra, or Yarra Yarra River, 3044.
Yarrow River, 3202.
Yates, Edmund Hodgson, 3202, 2327.
Yates, Richard, 3202.
Yates, Robert, 3202.
Yawl, 320, 3198.
Vaws, 3203: leprosy, 1573 Yaws, 3203; leprosy, 1573. Yazoo City, Miss., 3203, 1809. Yazoo River, 3203, 1808. Year, 3203, 1839, 2479, 2575. Yeast, 3203, 213, 365. Yeats, William Butler, 3203. Yeddo. See Tokio, 2890. Yell Shetland Islands, 2614 Yell, Shetland Islands, 2614. Yellow, 3203, 629, 2703. Yellow Bird, 3203. Yellow Fever, 3203, 993, 1858. Yellow-Hammer, 3204. Yellowlegs, 3204. Yellowlegs, 3204.
Yellow Peril, 1827.
Yellow River, 1308.
Yellow Sea, 3204, 162, 674, 3201.
Yellow Springs, Ohio, 1697.
Yellowstone Lake, 3191, 3204.
Yellowstone National Park, 3204, 805, 3191.
Yellowstone River, 3204, 1810.
Yemen, Arabia, 3205, 125.
Yen, 3206, 1440, 1826.
Yenikale, Strait of, 3206, 201.
Yenisei River, 3206, 2425.
Yeniseians, 2626.
Yerkes, Charles Tyson, 3206, 2839. Yerkes, Charles Tyson, 3206, 2839. Yerkes Observatory, 3206, 556, 2015. Yesso, or Yezo, Island, 3206, 42, 1441. Yew, 3206: hemlock, 1283. Ygdrasil, 3207; ash, 161. Yiddish, 3207. Yiddish, 3207. Yokohama, Japan, 3207, 1441. Yokosuka, Japan, 3207. Yonge, Charlotte Mary, 3207. Yonkers, N. Y., 3207, 1958. Yoritomo, of Japan, 1442. York, England, 3208. York, George Frederick Ernst Albert, 2311. York, House of, 3208, 922, 2451. York, Neb., 3207. York, Pa., 3208, 2151. York, Pa., 5200, 2101. York River, 3208. Yorktown, Va., 3208, 680. York von Wartenburg, Hans, 3209. Yoruba, Western Africa, 715. Yosemite Valley, 3209, 2589; Falls, 3101. Yoshihito, 1443, 1884.

Youmans, Edward Livingston, 3209.
Young, Brigham, 3210, 1850, 3006.
Young, Charles Augustus, 3210.
Young, Edward, 3210, 3237, 3245, 3251.
Young, John Russell, 3210.
Young, Samuel Baldwin Marks, 3211.
Young Germany, 3211.
Young Italy, 3211.
Young Men's Christian Association, 3211.
Young Pretender, The, 538.
Youngstown, Ohio, 3211, 2024.
Young Women's Christian Association, 3211.
Ypsilanti, Mich., 3211, 1779.
Ytterbium, 547.
Yttrium, 3212, 547; yttria, 858.
Yucatan, 3212, 1772.
Yucatan Channel, 482, 1776.
Yuca, 3212.
Yuen, Mongols of, 1523.
Yukon, 3213, 458.
Yukon River, 3212, 49, 2425.
Yula River, 675.
Yuma, Ariz., 3214, 143.
Yumas, 3214; Mohave, 1819.
Yverdun, or Yverdon, Switzerland, 3214, 2171.

Z

Z, 3215, 2803, 2951.
Zaandam, Netherlands, 3215.
Zabrze, Germany, 3215.
Zacatecas, Mexico, 3215; state of, 2638.
Zachau, Frederick Wilhelm, 1246.
Zacharias, 1082, 1462.
Zaleski, Józef Andrzej, 2248.
Zalinski, Edmond Louis Gray, 3215, 850.
Zama, Battle of, 494, 1249, 2560.
Zambezi Basin, 31, 3215.
Zambezi Falls, 3101.
Zambezi River, 3215, 779, 1977.
Zamenhof, L. L., 937.
Zanesville, Ohio, 3216, 2024.
Zangwill, Israel, 3216.
Zante, Island, 3216, 1400.
Zanzibar, 3216, 378, 1611.
Zápolya, John, 1339.
Zealand, or Zeeland, Island, 3216, 781.
Zebra, 3216, 2344, 2960.
Zebú. See Cebő, 514; Philippines, 2187.
Zebu, 3217, 2071.
Zebub Fly, 32; tsetse, 2930.
Zebulun, or Zebulon, 3217, 1455.
Zechariah, or Zachariah, 3217, 289, 2320.
Zedekiah, 3217, 1450.
Zeeland, 3216, 781, 1924, 3070.
Zeisberger, David, 3218.
Zeller, Eduard, 3218, 3228.
Zenlaya, José Santos, 3218.
Zeller, Eduard, 3218, 3228.
Zend-Avesta. See Avesta, 199.
Zenger, John Peter, 3218.
Zend-Avesta. See Avesta, 199.
Zenger, John Peter, 3218.
Zenith, 3218, 1887, 2252.
Zeno, 3218, 1194, 1619, 2195.
Zeno (Emperor), 3218, 422.
Zenobia, Septimia, 3219, 186, 2886.
Zenta, Battle of, 944, 2834, 2943.
Zephaniah, 3219, 289, 2320.
Zeppelin, Ferdinand, 3219, 217, 1024.
Zero, 3219, 141, 2861.

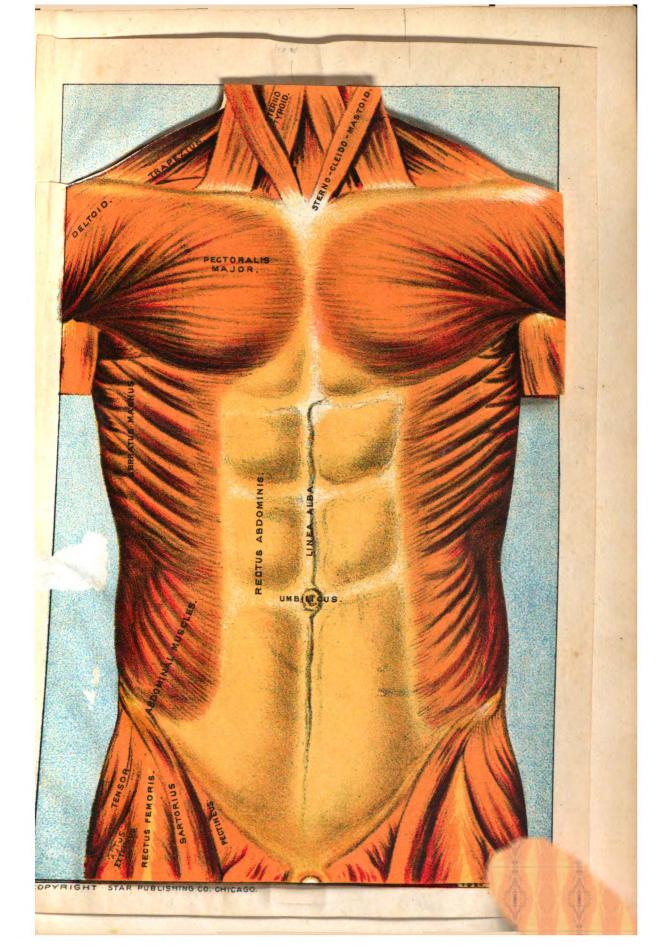
Zethus, 92.
Zeus, 3219, 90, 1479, 2034.
Zeus, 3219, 90, 1479, 2034.
Zeusis, 3220, 2113.
Zhitomir. See Jitomir, 1458.
Ziethen, Hans Joachim von, 3220.
Zilleh, or Zileh, Asiatic Turkey, 3220.
Zinchen, Grammermann, Johann Georg von, 3220.
Zinc, or Spelter, 3220, 433, 547, 1766.
Zinc Etching, 3221, 923.
Zincography, 1607.
Zinc White, 3221.
Zinzendorf, Nicholas Lewis, 3221, 3122.
Zion, Mount, 3221, 1451.
Zion City, Ill., 574.
Zionists, 3221, 1452.
Zirconium, 547; zirconia, 858.
Ziska, or Zizka, John, 3222, 1344.
Zither, 3222.
Zittau, Germany, 3222.
Zittau, Germany, 3222.
Zittau, Germany, 3222.
Zittau, Germany, 3223.
Zoëa, 1545; crab, 694.
Zodiac, 3223, 866, 2798.
Zodiacal Light, 3223.
Zola, Émile, 3223, 831, 1048, 1049.
Zollicoffer, Felix Kirk, 3223.
Zöllner, Heinrich, 3224.
Zöllner, Johann K. F., 2776.

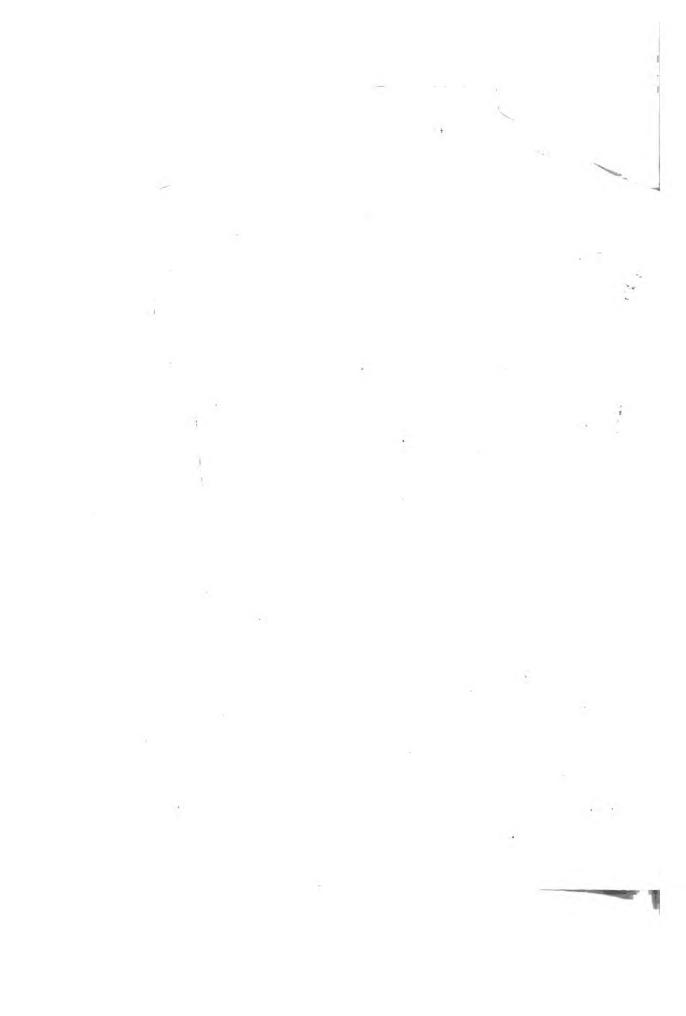
Zollverein, 3224, 731.
Zomba, Nyassaland, 376.
Zone, 3224, 856, 2575, 2924.
Zoögloea Stage, 208.
Zoölogical Garden, 3224, 583, 1960.
Zoölogy, 3225; animal, 104; biology, 296; ichthyology, 1359; physiography, 2206.
Zoöphyte, 3225; polyp, 2265.
Zoötomy, 95; anatomy, 3225.
Zoroaster, 3225, 1001, 2114, 2164.
Zouave, 3225.
Zschokke, Johann Heinrich Daniel, 3226.
Zuby, John Joachim, 3226.
Zuccaro, Taddeo, 3226.
Zug, Switzerland, 2795.
Zugspitze, Mount, 249, 1125.
Zululand, 3226, 1283, 1901.
Zululand, 3226, 1283, 1901.
Zumpango, Lake, 459.
Zuñi Mountains, 3227; city, 2331.
Zurich, Lake, 3227, 2793.
Zurich, Switzerland, 3227, 2795.
Zutphen, Battle of, 2629.
Zuyder Zee, 3227, 92, 1925, 3198.
Zwickau, Germany, 3227, 2543.
Zwingli, Ulrich, 3227, 931, 2389, 2796.
Zwolle, Netherlands, 3228, 1409.

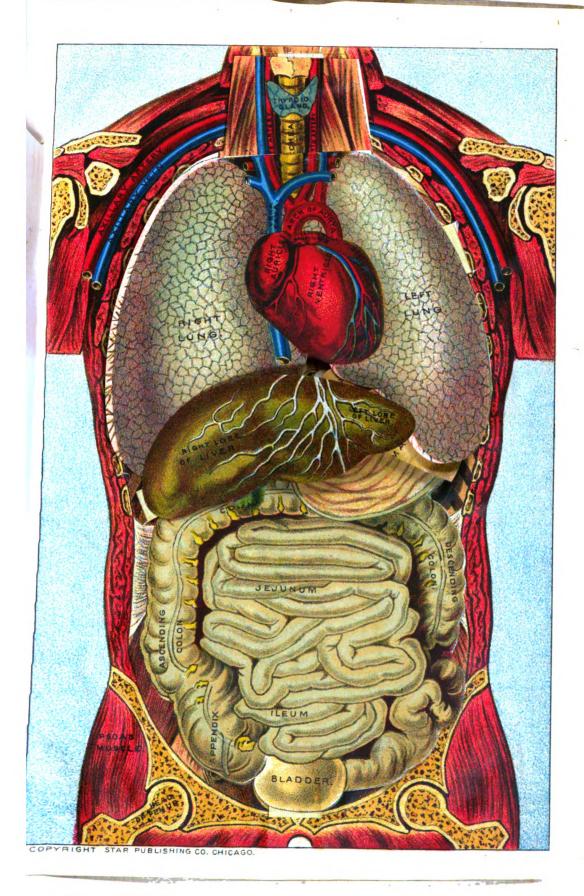
¥				
			•	**
	±			
				Ā.
		a		*
		-		

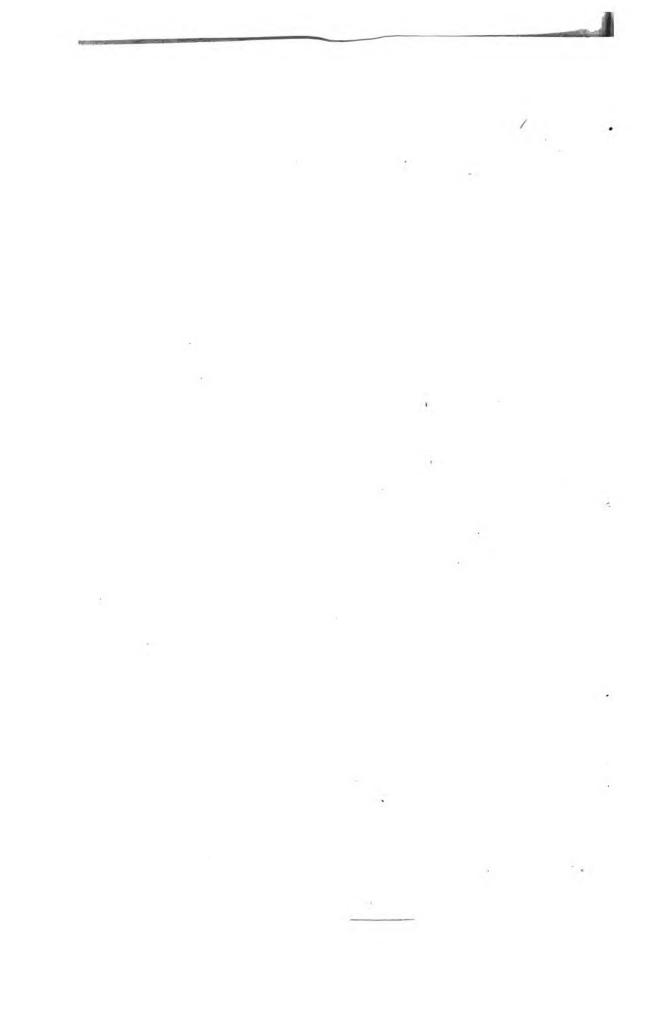
		•	

		18			
-3	 	-	-	 	









	3
	·
*	

